THE UNIVERSITY OF ALBERTA

HUNTER-LANDOWNER RELATIONS IN EAST CENTRAL ALBERTA: A SOCIOECONOMIC STUDY OF A PROPERTY RIGHTS CONFLICT

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

DEPARTMENT OF RURAL ECONOMY

EDMONTON, ALBERTA

SPRING, 1976

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "Hunter-Landowner Relations in East Central Alberta: A Socioeconomic Study of A Property Rights Conflict" submitted by Leonard John Ewanyk in partial fulfillment of the requirements for the degree of Master of Science.

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ABSTRACT

The hunter-landowner conflict consists of two interrelated problems: (1) hunter access to game populations and (2) the production of wildlife on private lands. Present government policies do not permit an equitable distribution of the costs and benefits from wildlife resources that accrue to members of society. This state of affairs leads to an imbalance of property rights, which creates problems for the conservation of wildlife on private lands. Resolution of the hunter-landowner conflict requires a set of programs that adhere to the landowner's interests and encourages the production of wildlife. The present study has provided insight into alternative programs that could be used to resolve the conflict.

A questionnaire survey of the landowners in the east central part of Alberta was carried out to evaluate the effects of alternative programs on resolving these two problem areas. An evaluation of the access problem revealed that the situation in Alberta is not critical, but it is intensifying. The present situation, however, can be improved by instituting programs that reduce the risk of property damages and improve the general conduct of hunters. A compulsory hunter training program is of particular importance in resolving the problem of hunter access to private lands. Encouraging landowners to create, improve and maintain wildlife habitat areas on private

lands could be achieved by one of two programs. A government subsidy for unimproved land or a habitat improvement program could encourage the production of game populations. However, the effectiveness of these systems may be significantly enhanced if both of these programs were integrated into one policy.

If public hunting is to continue in Alberta, government agencies must be aware of the possible methods of alleviating the hunter-landowner conflict. This study may serve as a policy guideline in obtaining this objective.

ACKNOWLEDGEMENTS

The financing of this study was provided through a grant from the Alberta Agricultural Research Trust.

The completion of this thesis would never have been possible without the cooperation and support of numerous individuals. I am deeply indebted to my supervisor, Dr. W.E. Phillips, for his guidance and helpful suggestions. In addition, I would like to thank Dave Neave, Carol Ward and Elmer Kure for their cooperation.

Above all, I wish to express my sincere appreciation to my wife, Carol, for her encouragement, love and patience during the time this thesis was in the making.

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CHAPTER I

INTRODUCTION

The Problems and Objectives of the Study

The wildlife of Alberta are a public resource. That is, wildlife are held in trust by the Crown with ownership vested in the people. However, in many instances, the habitat upon which wildlife depend for survival may be privately owned.

Property rights surrounding wildlife and its habitat, as with all property rights, are created, defined and limited by society's system for laws. Property rights in natural resources are institutional forces that directly effect the allocation and conservation of the resource. Property rights in wildlife resources consist of a bundle of different rights. The individual strands of these rights are distributed among the user, the government, the landowner and others in society. The interface separating the jurisdiction vested in each group of people creates conflicts of objectives. Such a case arises with wildlife on private lands.

This study focuses on the hunter-landowner conflict which consists of two related problems. One problem is a conflict of interest between sport hunters and individual landowners. Although wildlife are a public resource, those individuals that control the habitat bear the costs associated with feeding and accomodating the game. Where hunting takes place, those con-

trolling the land may suffer additional costs in the form of inconvenience, loss of privacy and property damages. The private landowner often receives little or no benefits in return. Those entities in society other than the landowner, but including the hunter, receive the majority of the benefits accruing from wildlife resources. Therefore in an effort to control public access, landowners often post their land against trespass, which may impose an external cost on the sportsman.

This state of affairs gives rise to a second problem which involves the disappearance of privately held habitat. Although wildlife are a renewable resource, wildlife populations through time are limited by the carrying capacity of the available habitat. Private landowners often have little or no incentive to retain and support wildlife because the resulting benefits accrue to other entities. The distribution of costs and benefits arising from wildlife utilization leads to an imbalance of property rights. That is, the elements of this conflict effect private land use decisions in such a manner that the landowner may destroy habitat areas without considering the cost of his decision upon other social groups.

This study attempted to determine the attitude of landowners towards public hunting and habitat retention on private lands. The objectives were:

1. To outline the elements of the hunter-landowner

conflict, giving special consideration to the incidence of benefits and costs stemming from wildlife utilization;

2. To describe different types of policies used in other countries to alleviate similar conflicts;
3. To examine and evaluate the feasibility of these alternative programs in resolving the imbalance problem in Alberta;
4. To formulate a set of programs specific to Alberta that will realign the incidence of costs and benefits derived from wildlife resources.

The conflict between landowners and hunters is the result of the allocation of property rights in wildlife resources -- the public ownership of wildlife versus the private ownership of land and habitat. Resolution of this conflict may benefit all segments of society without significantly altering current land use patterns. Moreover, it may enhance the flow of wildlife resources for future generations.

Empirical Setting

The central part of Alberta east of Edmonton (Figure 1) typifies the problems just described. Virtually all the land in this area is under private ownership and it experiences moderately heavy hunting pressure. The area has a good potential for wildlife production, but the loss of prime habitat areas, primarily to agricultural pursuits, has limited its wildlife productive capacity. The area under study includes Counties 20, 25, 30, 9, 22, 21, 27, and 29. Only those parts of Counties 20 and 25 lying east of Highway 2 and those parts of Counties 21 and 27 lying west of and including Range II west of Meridian 4 are included. The total area is approximately 7,100 square miles (18,320 square kilometers).

One national park, Elk Island Park, and one provincial park, Miquelon Lake, are situated within the study area. The Rochan Sands and Big Knife provincial parks are located on the area's prescribed boundaries.

The population of the study area is located predominantly in the towns and villages, with a scattered distribution throughout the rural areas. Camrose is the only city found within the region. Some of the larger towns include Leduc, Vegreville, Viking, Two Hills and Tofield.

The study area is essentially a mixed farming area. Approximately 75 percent of the land is classified as

FIGURE 1
COUNTY MAP OF STUDY AREA

"improved".[1] Of this proportion, crop production constitutes 48 percent. Summerfallow and pasture make up the remainder. The "unimproved" land consists of native pasture, woodlots, sloughs and shelterbelts.

The area is drained by the North Saskatchewan and Battle River systems. Numerous lakes and minor streams dot the area. Small sloughs and marshes are abundant.

The area has a continental climate, characterized by warm summers and cold winters. The mean summer and winter temperatures are 13.3°C and -16.7°C, respectively. The average annual precipitation is 40.6 to 45.7 cm per year. The frost-free period varies with location but generally exceeds 100 days in length.

The area lies within the vegetation zone known as parkland or aspen parkland. The predominant soils are Black and Thin Black. The terrain varies from level prairie to hilly countryside, interspersed with woodlots, cultivated fields and grassland.[2] The entire area has an altitude between 2,000 and 3,000 feet (600 to 900 meters). In its natural state the aspen parkland is a mosiac of two plant communities, woodland and grassland. The dominant tree is the aspen poplar. In typical areas, aspen groves alternate

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[1] Statistics Canada, Census of Canada, 1971: Agriculture, Alberta, Cat. No. 96-710, Vol. IV, Part 3-3 (Ottawa: Statistics Canada, 1973).

[2] Information on the parklands of Alberta was taken from W.G. Hardy, Alberta: A Natural History (Edmonton: MisMat Corporation, 1967); Government of Alberta, Atlas of Alberta (Edmonton: University of Alberta Press, 1969).

with grassland while stands of aspen and willow mingled with conifers increases the range of the woodland.

The aspen parkland forms an ecotone between the prairie and coniferous forest. Its ecological diversity provides habitat for a variety of game species. The study area, in general, has a high capacity for the production of wild ungulates.[1] Mule deer are found throughout the entire region. However, as agricultural cultivation is intensified, their inherent inability to adapt has resulted in declining numbers. On the other hand, the ability of white-tailed deer to adapt to the presence of man has attributed to increasing numbers within the area. The prime wintering ranges for the deer lie along the river and stream valleys. The area's productive capacity for deer is limited by its uniform topography which does not provide the required diversity of habitat. The proper management of the remaining habitat is essential to maintain the area's existing capacity for ungulate production.

A variety of upland bird game inhabit the parklands. Ring-necked pheasants, Hungarian partridge, ruffed grouse and sharp-tailed grouse are the most common species. These upland birds are widely distributed throughout the study area in varying concentrations.

Favourable waterfowl habitat is provided by the large

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[1] Information on the wildlife in the study area was obtained from Department of Regional Economic Expansion, Land Capacity for Wildlife - Waterfowl: Canada Land Inventory (Ottawa: Queen's Printer, 1970); Agricultural and Rural Development Act, Land Capacity for Recreation: Canada Land Inventory (Ottawa: Queen's Printer, 1968); Environment Canada, Land Capacity for Wildlife - Ungulates: Lands Directorate (Ottawa: Information Canada, n.d.).

number of potholes and marshes. Some areas may contain over 80 potholes per square mile. The more common nesting ducks include mallards, pintails, shovellers, red-heads and blue-winged teals. Geese frequent the area during their annual migrations. Drainage of small water bodies on private lands represents the major constrain on the area's waterfowl production capacity. Several of the lakes in the area have a high capacity for waterfowl production. They also serve as staging and migration areas. Included in this category are Beaverhill, Whitford, and Big Hay Lakes.

The study area experiences moderately heavy hunting activity. It was estimated that in 1971,[1] resident and non-resident bird game hunters spent a total of 74,616 days hunting[2] in the study area. This represents approximately 15.8 percent of the total hunter days spent by bird game hunters in Alberta. The area also provided 12,502 days of hunting activity for resident and non-resident big game hunters. The popularity of this area is partly attributed to its close proximity to Edmonton.

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[1] The estimates of hunting activity in the study area were taken from W.S. Pattison, "We Raise 'Em-You Shoot 'Em: A Study of Public Hunting on Private Lands", Alberta Department of Agriculture, Resource Economics Branch, Edmonton, 1973. (Mimeographed.) These estimates were obtained through extrapolation of the results obtained by R.J. Miller, "An Economic Evaluation of Alberta'a Sport Hunting and Fishing Resources" (unpublished M. Sc. Thesis, University of Alberta, Edmonton, 1971).

[2] A day of hunting or "hunter day" is defined as a whole or any part of a day spent in game hunting activity.

This concentration of hunters has influenced the landowners in the study area to post their farmland against hunting. In 1971, approximately 30 percent of the land in the area surveyed by Pattison was posted.[1] It was reported that by 1972, this total would increase to 41 percent. By comparison, less than 1 percent of this land was posted in the early 1950's. The trend of increased posting of land is indicative of the conflict between game hunters and landowners in the study area.

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[1] Information on the posting of land was taken from W.S. Pattison, op. cit., pp. 10-13.

CHAPTER II

CONCEPTUAL FRAMEWORK

Wildlife Resources

Wildlife are a renewable resource that are characterized by a critical zone. Ciriacy-Wantrup formally defines a critical zone as:

> ...a more or less clearly defined range of rates below which a decrease in flow cannot be reversed economically under present foreseeable conditions.[1]

In other words, although wildlife are continuously replenished over time by nature, the rate of flow can be reduced to zero by human action. Destroying the breeding stock of a certain species or its unique habitat may cause the rate of flow to become irreversible.

Wildlife are a valuable natural resource because of the satisfaction they provide. Their utility to society stems from both non-consumptive and consumptive uses. Non-consumptive uses, where one person's consumption of wildlife does not generally reduce or prevent another individual's consumption, include viewing, photographing and studying wildlife.

Although no market system exists to reflect the intangible values associated with the non-consumptive uses of wildlife, they are important. People value the existence of

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[1] S.V. Ciriacy-Wantrup, Resource Conservation: Economics and Policies (3rd ed.; Berkeley: University of California Agricultural Station, 1968), p. 39.

wildlife and gain satisfaction from knowing they are available for future generations.

> An option demand may exist, therefore, not only among persons currently and prospectively active in the market for the objective of the demand, but among others who place a value on the mere existence of biological and/or geomorphological variety and its widespread distribution.[1]

The major consumptive use of wildlife is sport hunting. Hunting is a popular form of outdoor recreation that yields social net benefits to society in general. These benefits consist of both market and extramarket values. The revenue collected from the sale of hunting licenses constitutes the direct market benefits accruing from the sport. These hunting fees are the major source of revenue for public expenditures on the management of wildlife throughout the province. Yet the fee assessed each hunter for a license is nominal and does not reflect the full value of the activity.

A large part of the benefits derived from hunting are non-priced values. These extramarket benefits, although difficult to evaluate, are real. They are described as the value a sportsman receives from the opportunity to participate in the activity. Hunters gain utility from many elements of the experience. Escapism, companionship with peers, and close contact with nature have been cited as being particularly

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[1] J. Krutilla, "Conservation Reconsidered", American Economic Review, Vol. 59 (1967), p. 781.

important.[1] The satisfaction a hunter receives need not stem from successfully obtaining game, but from the probability of success.

> The pleasure of hunting comes more from the process than from the product. The product is necessary, however, because it supplies the logical end of the process.[2]

The extramarket benefits for hunters in Alberta have been calculated by asking the sportsman: "Approximately how much do you think a day's hunting is worth above what you spend on travel and other expenses?" (Table 1). Multiplying the average values obtained by the total number of days hunted yields an estimate of the total extramarket benefits received from the activity.[3]

The sum of the license fee (market benefits) and extramarket benefits equals the direct social benefits accruing to society. For the 1969 hunting season, Miller estimated that these two benefits were approximately 1.4 and 7.1 million dollars, respectively.[4] Subtracting the administrative costs for wildlife management yields an estimate of the social net benefits accruing from game hunting. It represents the net

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[1] D. Porter, J. Hendee, and R. Clarke, "Hunting Satisfaction: Game, Guns, or Nature?" 38th North American Wildlife and Natural Resources Conference Transactions (Washington, D.C.: Wildlife Management Institute, 1973), pp. 220-229.

[2] T.A. More, "Attitudes of Massachusetts Hunters," 38th North American Wildlife and Natural Resources Conference Transactions (Washington, D.C.: Wildlife Management Institute, 1973), p. 234.

[3] The benefits to both resident and non-resident hunters are included when calculating the extramarket benefits of hunting activity to society.

[4] R.J. Miller, op. cit., p. 49.

Table 1

EXTRAMARKET BENEFITS -- HUNTERS IN ALBERTA, 1969

Category	Per Day ($)
Resident Bird Game Hunters	6.86
Non-Resident Bird Game Hunters	7.96
Resident Big Game Hunters	9.98
Non-Resident Big Game Hunters	13.82

Source: R.J. Miller, "An Economic Evaluation of Alberta's Sport Hunting and Fishing Resources" (unpublished M. Sc. thesis, University of Alberta, Edmonton, 1971), pp. 74 and 78.

value of the sport to society in general. For the same data, the net social benefits was determined to be 7,589,098 dollars. To determine the total benefits derived from wildlife resources, the non-consumptive values, both positive and negative, would have to be estimated. This evaluation has yet to be done.

Maximization of the present value of the social net revenue may be taken as an objective of conservation.[1] It is referred to as the optimum state of conservation. Since it is an utopian state, a more practical objective for conservation policy is to increase, incrementally, the present value of the social net benefits attributable to the resource.

> The practical objective of conservation decisions is not the optimum distribution of use rates over time, but a step-by-step directional change of the existing or some hypothetical distribution toward the optimum. The optimum state of conservation can only be approximated step-by-step, through trial and error.[2]

In determining the optimum state of conservation, all costs and revenues must be considered, regardless of incidence. Incidence in this context refers to the distribution of costs or benefits received or paid by the different individuals or groups.

Through the property rights invested in ownership, the landowner controls the land and its allocation. Because wildlife resources are a by-product of the land, individual landowners bear the supply costs. Land resources are often

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[1] For the purpose of this discussion, revenues may be synonymous with profit, utility, satisfaction or income.

[2] See S.V. Ciriacy-Wantrup, op. cit., p. 81 for a discussion of this concept.

allocated to the use that provides the highest and best economic returns. This is the principle of "succession of land use".[1] The criterion for allocation is the expected stream of costs and returns over time that are incident upon the planning agent. The entrepreneur does not or cannot account for the costs of his decision upon others. This often occurs because the costs involved are difficult to capture or identify.

As pointed out earlier, wildlife values are to an extent social values, being recreational and esthetic. They are extramarket in character and are not readily measured in conventional economic terms. The inability of landowners to account for wildlife values often results in a conflict between private and social priorities in land use. Private land use decisions that remove or reduce habitat areas may oppose the interests of the public sector. The public, interested in wildlife conservation, may prefer that the land be left in its natural state.

The resulting distribution of the revenues and costs accruing from wildlife resources leads to an imbalance of property rights.[2] That is, the landowner, who is responsible for wildlife conservation decisions, does not account for all

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[1] See R. Barlowe, Land Resource Economics: The Economics of Real Property (2nd ed.; Englewood Cliffs, N.J.: Prentice-Hall Inc., 1972), pp. 186-197.

[2] For a discussion of this concept see S.V. Ciriacy-Wantrup, op. cit., pp. 147-149.

the costs and revenues involved in land use. This may result in a misallocation of land resources from society's point of view. It may also result in an irreversible decrease in habitat areas that are essential for the production of wildlife resources.[1]

The resulting conflict between the objectives of the private and public sectors is largely attributed to the overlapping property rights in land and wildlife resources. Wantrup defines property as "a bundle of rights to control."[2] It involves the right to use assets or resources in alternative utility-yielding ways. Therefore, ownership can be viewed as "a bundle of legally defined user rights to an asset."[3]

Dales states that ownership always consists of:

1. A set or rights to use property in certain ways (and a set of negative rights, or prohibitions, that prevent its use in other ways);
2. A right to prevent others from exercising those rights, or to set the terms on which others may exercise them; and
3. A right to sell your property rights.[4]

In the strictest legal sense, it is user rights that are owned, never the asset itself.

Wildlife resources are a restricted common property.

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[1] Irreversible is used in the economic context.

[2] S.V. Ciriacy-Wantrup, op. cit., p. 141.

[3] J.H. Dales, "Land, Water, and Ownership," Canadian Journal of Economics, Vol 1 (1968), p. 795.

[4] J.H. Dales, Pollution, Property and Prices, (Toronto: University of Toronto Press, 1968), p. 59.

That is, their use is restricted by the government, but virtually anybody can use or abuse them at almost zero cost. The bundle of interests or user rights in wildlife are distributed among the government, the hunter, the landowner and the public sector. No one group has the exclusive user rights.

On the other hand, landowners control the largest bundle of user rights in land resources. Property rights to land have been well established. Full ownership gives the landowner the right to use, exploit or abuse the resource. Therefore, the entrepreneur has a legal right to destroy habitat areas. He may also legally refuse access to wildlife on his land. Society, and especially the hunter, may feel that their rights have been impaired but they cannot restrict the landowner's activities. Nor are they compensated for the resulting external costs.

The distribution and lack of definite property rights in wildlife permit landowners to abuse the resource at zero cost. The property rights of land ownership have legal priority and the landowner's interest prevails.

The Hunters' Situation

The general trend towards increased leisure time, higher incomes, improved mobility and urbanization has contributed to the increased demand for sport hunting. Hunting is a popular form of recreation that provides the opportunity to periodically come into contact with nature. The esthetic

value of the sport is derived from the pursuit of the game, the application of skills and interaction with wildlife.

In 1969, Alberta provided 836,000 days of hunting activity.[1] Of this total, 56 percent was attributed to big game hunting and the remaining 44 percent was accounted for by bird game hunting. Resident hunters allocated approximately 7.1 days to the sport and spent, on the average, 9.77 dollars per day. Non-resident hunters spent an average of 6.9 days hunting with an expenditure of 51.43 dollars per day.[2] The market and extramarket benefits from hunting activity were discussed earlier. It will suffice to note that the total benefits derived from the sport are important to Albertans and to the provincial economy.

Some criticism of hunters has centered around the belief that hunting adversely affects the abundance of wildlife. Wildlife are a fugitive resource. This means that ownership in wildlife is acquired only by reducing them to possession. Since hunting activity reduces numbers, it is commonly assumed that it results in the depletion of the resource.

Modern game management programs are based on the principle that populations should not exceed the carrying capacity of the available habitat. Over population may lead to starvation, disease and the destruction of habitat for

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[1] Miller, op. cit. p. 36.

[2] Ibid., pp. 72 and 77.

future generations of wildlife. If properly managed, hunting activity assists in keeping populations of some species healthy and in balance with their habitat. If frequently replaces other forms of mortality. An area can support a certain number of animals and if the surplus is not harvested, it may be wasted.

Therefore, the annual harvest of game may be necessary to ensure the conservation of wildlife. Scott defines conservation as "a public policy which seeks to increase future useable supplies of natural resources by present action."[1] Sport hunting can be used to preserve the desirable balance between wildlife and the available habitat. This balance maintains present game populations which ensures future rates of flow of the same or greater magnitude.

The hunters of Alberta also contribute financially to the conservation of wildlife. Although wildlife are a public resource, hunters help finance their management. Hunting fees are the major source of revenue for government expenditures on the conservation and management of game and non-game species throughout the province. In addition to the regular license fee, each hunter is assessed a one dollar charge which goes to finance the Wildlife Habitat Program.[2]

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[1] A. Scott, Natural Resources: The Economics of Conservation (Toronto: Toronto University Press, 1955), p. 30.

[2] Alberta Department of Lands and Forests, Annual Report (Edmonton: Queen's Printer, 1972-73), p. 67.

Initiated in 1972-73, this program is directed towards the development, improvement and protection of wildlife habitat areas. An individual's decision to hunt, via the collection of hunting fees, contributes directly to the conservation of wildlife in Alberta.

A second program funded by sport hunters also exists. The Alberta Fish and Game Association is recognized as the spokesman for the organized hunters in the province. Based on the recommendations from this association, the Government of Alberta instituted the Wildlife Damage Fund.[1] This fund compensates individual landowners who incur costs from damages caused by wildlife. The program is financed from a three dollar fee assessed each licensed hunter in Alberta.

> Hunters felt that if they provided the funds for crop damage payments, the relationship between landowners and hunters would be improved and that better access would be obtained to private lands.[2]

The Wildlife Damage Fund was developed for the landowner's benefit.

The Alberta Fish and Game Association was also instrumental in developing the Alberta Hunter Training Program. The training program is designed to instruct hunters on gun handling, conservation principles and hunting etiquette. Through

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[1] Information pertaining to the Alberta Fish and Game Association was obtained through personal correspondence with the Association's public relations officer, Elmer Kure.

[2] S.B. Smith, "Wildlife Damage Legislation in Alberta," 32nd Federal-Provincial Wildlife Conference Transactions (Ottawa: Information Canada, 1968), p. 43.

education the program is aimed at upgrading the quality of hunters which could significantly reduce the conflict between landowners and hunters. The Association through its affiliated clubs also promotes and finances local projects to enhance wildlife populations. The Alberta Fish and Game Association endorses the right of public ownership of wildlife and it opposes any system or sale of rights that will alter this principle.[1]

> We, however, endore a vertical plan to compensate landowner farmers who effectively create or retain wildlife habitat on their lands. We believe that most farmer landowners would favor a system of payment for habitat than a direct hunter fee.[2]

This organization also supports the right of landowners to control who may enter their land.

Alberta hunters are more than a source of revenue. As outlined above, they have initiated policies for the benefit of landowners, as well as themselves and for the conservation of wildlife resources. Society undoubtedly receives some of the resulting external benefits.

The purchase of a hunting license legally permits the harvest of certain wildlife species. It does not, however, permit the right to enter private lands. Entry to private lands is not a right but a privilege.

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[1] Alberta Fish and Game Association, "Habitat Retention Compensation to Farmers and Rancher Landowners, Qualified Hunter," Policy Statement No. 4.3 (Edmonton: Alberta Fish and Game Association, n.d.), (Mimeographed.)

[2] Ibid. p. 1.

The Landowners' Situation

A farmer is a businessman. One of his objectives may be to maximize profits by the proper allocation and management of his available resources.[1] Wildlife resources are a by-product of the land. The costs of their production are imposed, at least partly, on the individual landowners. The supply costs associated with feeding and accommodating wildlife may have a negative impact on the landowner's income. Among the Alberta landowners surveyed in 1968, 57 percent reported that they incurred crop damages from waterfowl.[2] However, only 7 percent claimed for compensation. Two reasons are put forth for the low percentage of claims:

1. Damage is considered by many landowners to be an occupational risk.
2. Some landowners do not know that a compensation program exists.

The threshold of tolerance to wildlife depredation was determined to be approximately 500 dollars. The report estimated that 6 million dollars were the direct costs of waterfowl depredation to Alberta farmers in 1968.[3]

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[1] Profits in this context may refer to income, utility or welfare.

[2] Renewable Resources Consulting Ltd., A Study of Waterfowl Damage to Commercial Grain Crops in Alberta (Edmonton: Renewable Resources Consulting Ltd., 1969), p. 57. (A report prepared for the Alberta Department of Lands and Forests.)

[3] Ibid., pp. 57-58.

To the landowner, wildlife represent an economic good to which a production cost is attached. To many landowners, the damages caused by wildlife represent a significant replacement value. Therefore, landowners may have an incentive to minimize wildlife populations on their property.

The above are not the only costs to the landowner. Cut fences, gates left open, risk to livestock and property damages are direct costs sometimes imposed by sport hunters. A study carried out in 1969 revealed that 58 percent of the ranchers in Southern Alberta felt that some damage or inconvenience had been caused by recreationists.[1] This damage was evaluated at approximately 187 dollars per ranch over all ranches or alternatively, 827 dollars per ranch that experienced the inconvenience.[2] Forty-six percent of the ranchers indicated that they felt wildlife imposed an additional cost on their operation. The cost imposed by recreationists and by wildlife combined were estimated to be 336 dollars per ranch annually. Thus, 56 percent of the total damages resulted from the activity of recreationists. The entrepreneur is not fully compensated.

Traditionally, landowners accepted hunting on their

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[1] Recreationists in this context refers to hunters, anglers, campers and picnicers in the aggregate.

[2] P.M. Moncrieff, "Alternative Land Uses in S.W. Alberta: A Study in Natural Resource Economics" (unpublished M. Sc. thesis, University of Alberta, Edmonton, 1972), pp. 79-82.

land. However, there has been a tendency for some hunters to abuse the landowners' hospitality. A landowner engaged in a farming enterprise may be faced with the inconveniences and damages stemming from hunting activity. In efforts to control access to private property, landowners post their land against trespass The increasing trend in posting is indicative of the landowner's concern.

Although wildlife are a public resource, a landowner may legally prevent hunters from entering his land. If private lands are properly posted, the owner's permission is required to gain access.[1] The responsibility for restricting trespassing is vested in the title of land ownership. However, signs are often ineffectual in the absence of active patrol. Some hunters enter posted land as though it was their right. They disregard the formality of receiving permission.

The posting of land imposes a technological external cost on the sport hunter.

> A technological externality exists when some activity of party A imposes a cost or benefit on party B for which A is not charged or compensated by the price system of a market economy.[2]

The hunter's utility is dependent upon the amount of wildlife produced by the landowner and on obtaining access to

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[1] To be properly posted, signs must contain the phrase "no trespassing".

[2] D.K. Whitcomb, Externalities and Welfare (New York: Columbia University Press, 1972), p. 6.

that game. The posting of private property restricts access and forces hunters to concentrate in non-posted areas. The sportsman desires a quiet and relaxing hunt on a reasonable area of territory. As the concentration of hunters in non-posted areas intensifies, it turns hunting into a man-to-man competition, which detracts from the esthetic value of the sport.

> The deteriorating attitudes towards hunting resulting from diminishing opportunity have also carried over into disrespect for landowner's rights and helped to trigger the development of the existing situation....[1]

Such attitudes, coupled with the increased pressure on unrestricted areas, will undoubtedly induce further posting at an exponential rate. This cyclic process will continue to intensify the hunter-landowner conflict and may severely constrain future hunting on private lands.

The posting of land does not always result from direct conflict with hunters or a personal dislike of the sport. Pattison found that 42 percent of the landowners surveyed approved of sport hunting.[2] Thirty-five percent were opposed and the remaining 23 percent were either neutral or non-specific.

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[1] Howard Paish and Associates Limited, Policy and Action for Hunting in the Lower Mainland (Vancouver: Howard Paish and Associates Limited, 1974), pp. 75-76. (A report prepared for the British Columbia Fish and Wildlife Branch.)

[2] Pattison, op. cit., p. 11.

Landowners surveyed by Pattison were also asked to specify the main reasons why they were opposed to hunting activity on their land (Table 2). Thirty-one percent of the replies reflected landowners' concern that hunting poses a danger to livestock and property. Although opposition to hunters has a definite basis in a fear of property damage, a good portion of the concern is related to the conservation of wildlife. In Pattison's study, the major opposition to hunting activity cited, accounting for 30 percent of the replies, was "wildlife preservation". Landowners may refuse access to hunters because they believe hunting is detrimental to wildlife populations. Landowners show a definite interest in the conservation of wildlife on their land despite the depredation damages they may incur. Landowners apparently gain utility or some personal satisfaction from seeing wildlife on their property and they are interested in preserving this opportunity. However, as discussed earlier, hunting can represent an important management tool for conserving wildlife resources.

Ironically, landowners are generally unaware of the deleterious effects of farming operations on wildlife. While agricultural production is not the only cause of habitat destruction, it represents a major threat. As farming effort is intensified, it may result in a consolidation of fields, drainage of potholes, elimination of woodlots, and less edge

TABLE 2

REASONS FOR OPPOSING HUNTER ACTIVITIES, 1971

Reason	Number of Times Cited	Percent of Total
Wildlife Preservation	195	30
Danger to Livestock	103	16
Danger to Property	94	15
Hunters are a Nuisance	82	13
Hunters Don't Ask Permission	27	4
Danger to Human Life	24	4
Miscellaneous	119	18

Source: W.S. Pattison, "We Raise 'Em - You Shoot 'Em; A Study of Public Hunting on Private Lands" (Edmonton: Alberta Department of Agriculture, Resource Economics Branch, 1973), Table 5, p. 12. (Mimeographed.)

effect. All these factors have a tendency to decrease the availability of habitat for wildlife populations.

Unimproved land such as woodlots, sloughs, and brushy areas are productive for wildlife resources. To the landowner, they may represent an opportunity cost. The opportunity cost of unimproved land is the revenue foregone by not utilizing the land in its best rent earning capacity. Barlowe states:

> Land use-capacity refers to the relative ability of a given unit of land resource to produce a surplus of returns and/or satisfactions above its cost of utilization. The amount of net return or satisfactions secured provides an index of relative use-capacity.[1]

A profit maximizing entrepreneur will generally allocate land resources to the alternative use that offers the highest rent earning capacity. As technology, price levels and the demand for agricultural products increase, it becomes more economical to shift unimproved land into production. As this shift towards agricultural production occurs, it results in the destruction of essential wildlife habitat.

The criteria for the allocation of land resources is the stream of expected costs and revenues that are incident upon the planning agent. The entrepreneur does not or sometimes cannot account for his decisions upon the public sector. This occurs partly because wildlife resources are to a great extent social values, being recreational and esthetic. They

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[1] Barlowe, op. cit., p. 13.

are not readily measured in monetary terms. Part of the problem may lie in the Wildlife Act which states:

> No person shall directly or indirectly sell, trade or barter or offer for sale access to any lands for the purpose of hunting and trapping....[1]

Therefore, at present there are no incentives, monetary or otherwise, to encourage landowners to maintain wildlife habitat or to permit access. A landowner who encourages wildlife production on his land is generally uncompensated for his efforts. A landowner who permits hunter access runs the risk of property damages for which he may not be fully compensated.

The landowner's situation was summarized in a report prepared for the Western Stock Growers' Association. It outlined various elements that should be considered in wildlife management policies. The Association feels the landowner should be assured that:

1. His costs of supplying game will be covered;
2. There is a procedure that gives him full knowledge of every hunter that has access to his property; and
3. He has control as to who comes onto the property and, as a consequence, has some control of the game kill on his land.[2]

The individual farmer is the key element in the hunter-landowner conflict. Since the landowner controls the land, his

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[1] Government of Alberta, Statues of Alberta, 1970, Part 1, Chapter 113.

[2] J.P. Hedlin and R. Hedlin, Game Policy Needs in Alberta (Toronto: Hedlin, Menzies and Associates Ltd.,,1971), p. 41. (A study prepared for the Western Stock Growers' Association.)

cooperation is essential. Therefore, the landowner's situation pertaining to supply costs, property damages, access control and wildlife preservation must be fully recognized. Public policies must account for these concerns in order to obtain the landowner's cooperation.

The Government's Situation

As indicated earlier, ownership, trust and the administration of wildlife resources are vested in the Crown. The government is entrusted with the legal responsibility of managing wildlife for the benefit of all segments of society. The over-all objective of wildlife conservation policies is:

> ...the maintenance and improvement of wildlife populations and their habitat for the esthetic, recreational and economic well-being of Albertans.[1]

Therefore, the Government of Alberta is responsible for developing wildlife policies, guidelines, and programs that conform to society's needs, wants and expectations.

For critical-zone resources, a safe minimum standard of conservation is often a relevant and valid first objective for public policies.

> A safe minimum standard of conservation is achieved by avoiding the critical zone -- that is, those physical conditions, brought about by human actions, which would make it uneconomical to halt or reverse depletion.[2]

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[1] Alberta Department of Lands and Forests, Fish and Wildlife Careers (Edmonton: Alberta Department of Lands and Forests, n.d.), p. 1. (Pamphlet.)

[2] Ciriacy-Wantrup, op. cit., p. 235.

This standard can be defined in terms of conservation practises that will maintain the economic possibility of halting and reversing a decrease in flow and use. For wildlife species, a safe minimum standard of conservation may entail maintaining a viable breeding stock and/or protecting its unique habitat. The economic rationale employed by this concept is that the costs of maintaining a minimum standard are generally small relative to the costs incurred if the resource is depleted. After such a standard is guaranteed, public policies can be initiated to move toward the optimum state of conservation. Therefore, a safe minimum standard of conservation can serve as a base level for conservation policies.

The government's responsibilities toward wildlife resources stem directly from the individual interest of three distinct parties -- the hunter, the landowner and society. The hunter expects the Government of Alberta to produce a surplus of wildlife for the purpose of public hunting, and to maintain the quality of the sport. From the landowner's point of view, his property rights must be protected. The objectives for society must include the conservation of wildlife resources for the enjoyment of future generations.

Regulations, having the effect of law, are the direct policy tools used to achieve these objectives. Bag limits, closed seasons, proper hunting techniques and equipment are hunting regulations that protect against the economic irrever-

sibility of depletion. Other laws and regulations have been instituted to provide an orderly harvest, to protect landowners from hunting activity and to produce revenue for administrative purposes.

An essential element for any regulatory system is enforcement or "police power".

> Enforcement is crucial to the success of any regulatory scheme. If regulations are ignored by hunters, other resource users, landowners or game managers, game and wildlife programs will fail no matter how basically correct, well funded and well administered. This is particularly important as regards access controls.[1]

As hunting pressures intensify, the benefits to be gained from regulating use increase and the costs of enforcement become more economically justified.

The lack of enforcement of hunting regulations in Alberta has been criticized by individual hunters.[2] It has been suggested that inadequate enforcement has contributed to the present conflict between landowners and hunters. In one study, landowners were asked if they had any suggestions for improving hunting laws and regulations.[3] A major suggestion given was "step up enforcement of present regulations"

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[1] A.R. Thompson and A.R. Lucas, "Landowner-Wildlife Relationships: A Preliminary Legal Study", 37th Federal-Provincial Wildlife Conference Transactions (Ottawa: Information Canada, 1973), p. 41.

[2] See M. Nielsen, "Enforcement", Defending All Outdoors, Vol. 8, No. 5, p.2. (Publication of the Alberta Fish and Game Association).

[3] W.S. Pattison, op. cit.

(Table 3). Less than 2 percent of the landowners were satisfied with the present regulatory system for hunting. The enforecement of hunting regulations has not dampened the hunter-landowner conflict as expected. In fact, it may have contributed to further development of the problem.

The Provincial Government has the responsibility of developing and maintaining the full potential of wildlife resources.They are also indirectly responsible for instituting broad social, economic and legal policies to conserve wildlife, its habitat and to enhance the benefits derived from the resource. To achieve such an objective requires the coordination of government agencies in developing a total land use policy for Alberta which incorporates a positive wildlife management program. The success of such a program will indirectly depend upon the formulation and execution of social policies that will alleviate the conflict between landowners and resource users.

TABLE 3

SUGGESTIONS BY LANDOWNERS FOR THE IMPROVEMENT OF HUNTING LAWS AND REGULATIONS, 1971

Suggestions	Number of Times Cited	Percent of Total
Present Situation Satisfactory	11	2.0
Step Up Enforcement of Present Regulations	126	22.6
Make Penalty Stiffer for Hunting Without Permission	72	12.9
Raise Minimum Age Requirement for Hunters	4	0.7
Restrict Hunting to Local People	5	0.9
Ban All Hunting on Private Lands	9	1.6
Ban All Hunting Near Farm Buildings	16	2.9
Ban All Hunting Near Population Centers	19	3.4
Make Hunting Training Compulsory	43	7.7
Shorten or Close Season	123	22.1
Allow Farmers to Hunt Unlicensed	29	5.2
Miscellaneous	100	18.0

Source: W.S. Pattison, Landowner Survey Response: We Raise 'Em - You Shoot 'Em (Edmonton: Alberta Department of Agriculture, Resource Economics Branch, 1973), p. 11.

Summary

Wildlife resources yield economic, esthetic and recreational benefits to society, but positive policies for the full development of these values are lagging. The increase in posted land and restrictive legislation, together with an ever shrinking habitat, are indicative of the inadequacies of present programs. The government's objective should be to develop and maintain the "highest and best" alternative uses for wildlife resources. Only then can the benefits derived from wildlife utilization be enhanced and possibly maximized.

To achieve this overall objective, private landowners must be encouraged to produce and to make available wildlife for society's consumptive and non-consumptive uses. Production of, and accessibility to, wildlife are two distinct problems yet they are intricately interwoven. Neither problem can be solved uniquely without directly effecting the other.

The hunter-landowner conflict arises and persists because the external economies and diseconomies of the situation prevent an equitable distribution of the costs and benefits derived from wildlife resources. A landowner, for example, may incur costs stemming from wildlife predation or hunting activity. By the same token, a hunter may incur external costs imposed by private land use decisions. The resulting externalities are reciprocal in nature and at present no effective means of internalizing the effects exist.

Resolution of the problem requires a public policy that

will realign the incidence of the costs and benefits in such a fashion that landowners are encouraged to conserve habitat and permit access to wildlife populations. The present study was undertaken to provide the background data necessary to develop such a policy for Alberta.

CHAPTER III

RESULTS

Data Procedure and Questionnaire Response

During 1971-1972, the Alberta Department of Agriculture conducted a landowner questionnaire survey to determine the causes of the conflict between hunters and farmers.[1] In conducting the survey, a random sample of six quarter-sections was drawn from the township grids within the selected study area. Corresponding quarters were selected from every township and the landowner's name was obtained from the county office files. This survey provided the basis and the necessary background information for the present study.[2] The original data from this survey was obtained by the author for further analysis. The results from this report will be used throughout the present study as a basis for comparison and contrast.

To provide more comprehensive results and analysis, the same sample of landowners selected by Pattison were used for the author's questionnaire survey. In other words, the sample of landowners and the study area were the same for both surveys. The sample consisted of 1,146 landowners. This represents approximately 14 percent of all the landowners

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[1] The survey was conducted by W.S. Pattison, op. cit.

[2] A copy of Pattison's questionnaire is contained in Appendix B.

in the study area.[1]

Recommendations from the Alberta Department of Agriculture and the Alberta Fish and Wildlife Division were used in the design of the questionnaire. The questionnaire and a covering letter were mailed to all the landowners in June, 1974.[2] Approximately one month later, a second copy of the questionnaire and a reminder letter were sent to those landowners who had not responded to the first mailing.

The response to the questionnaire is presented in Table 4. Of the questionnaires sent, 28 were returned unopened and 20 were returned unanswered.[3] This reduced the effective mailout sample to 1,098. The total number of questionnaires returned was 384, of which 373 were sufficiently completed for analysis. The total response was 34 percent.

TABLE 4

QUESTIONNAIRE RESPONSE

	Number
Total Questionnaires Mailed	1,146
Questionnaires Returned Unopened	28
Questionnaires Returned Unanswered	20
Questionnaires Returned Answered	384
Total Usable Questionnaires	373

[1] The total number of landowners in the study area was estimated from the number of census-farms reported by Statistics Canada, op. cit.

[2] A copy of the author's questionnaire is contained in Appendix B.

[3] Questionnaires were returned unanswered because the individuals no longer owned land within the study area.

Mailout surveys are subject to response and non-response bias. Response bias occurs if a respondent incorrectly answers a question either unintentionally or by design. In conducting this survey, proper questionnaire design was followed in an attempt to reduce the problem of response bias caused by a misunderstanding or misinterpretation of the questions.

Non-response bias may occur if the individuals who respond to the questionnaire differ from those who do not respond. A comparison of responses from the first and second mailing was used to detect non-response bias in this survey. It was hypothesized that if non-response bias existed, there would be a significant difference in the characteristics and attitudes of the respondents in the two mailings.

A chi-squared test was used to compare the two responses in respect to several variables. The variables tested for non-response bias were:

a. The number of landowners who allow deer hunting, upland bird hunting and waterfowl hunting with their permission.

b. The landowners' response to a proposed compulsory hunter training program; to a law forcing hunters to hunt on foot; to a government subsidy for unimproved land; and to a habitat improvement program.

At the 95 percent level of confidence, non-response bias was

not evident for any of the questions tested.[1] It was therefore assumed that the landowners who responded to the questionnaire were representative of the entire population.

To improve the interpretation of the results, landowners were categorized into two major groups. This classification was based on the landowners' response to the question: "If hunters ask permission, do you allow them to hunt on your land?"[2]

The first group of landowners, Group A, consisted of all the respondents who allowed at least one of the following types of hunting activity with permission -- deer, upland bird or waterfowl hunting. That is, a landowner was included in this group if he allowed one type of hunting, regardless of his answers with respect to the other two types of hunting activity. Group A consisted of 287 landowners. The second group of landowners, Group B, consisted of 68 individuals. Group B included all landowners who would not allow any of the three forms of hunting on their land.[3]

This classification was carried out because it was hypothesized that the response of the two groups would differ.

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[1] See Appendix C, Table C-1, for the chi-squared values calculated for each variable.

[2] This is question number 5 of the author's wildlife questionnaire.

[3] Eighteen landowners were excluded from this classification because they did not respond to the question.

It was assumed that Group A would respond more favorably to the proposed programs in the questionnaire. That is, it would be more difficult to change the attitudes of those landowners who do not allow any hunting activity on their land.

The response of the two groups to the proposed programs are shown in Appendix C. The two groups did respond differently as hypothesized. However, a chi-squared test could not in every case statistically prove that the response to the questions was dependent on the classification of the landowners.[1]

Wildlife Populations of Study Area

Landowners were given a list of different wildlife species and asked to indicate which species they had seen on their land during the past year and during the past winter.[2] The results are summarized in Table 5. The percentage of landowners in the study area who sighted wildlife species in 1971 are also presented in the table.

Results from this author's questionnaire indicate that ducks were sighted by 95.4 percent of the landowners; 59.2 percent sighted geese. Whitetailed deer were reported by 63.3 percent of the landowners while the sightings for mule deer

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[1] See Appendix C, Table C-2, for the specific questions for which the response to the question was dependent upon the classification of the landowners.

[2] Since the questionnaire was mailed out in June-July of 1974, the sightings reported by the landowners covered the preceding 12 months. Sightings during the winter months were for 1973.

TABLE 5

WILDLIFE SPECIES SIGHTED BY LANDOWNERS

Species	Percentage of Sample That Sighted Species Winter Months 1973-74	1973	1971*
Mule Deer	32.2	22.5	30
Whitetailed Deer	63.3	42.9	63
Sharptail Grouse	38.6	27.3	46
Ruffed Grouse	44.0	31.4	59
Pheasants	49.9	31.6	65
Hungarian Partridge	67.6	53.4	82
Geese	59.2		49
Duck	95.4		96

* The results reported for 1971 were obtained from W.S. Pattison, "We Raise 'Em - You Shoot 'Em: A Study of Public Hunting on Private Lands" (Edmonton: Alberta Department of Agriculture, Resource Economics Branch, 1973), Table 9, p. 20. (Mimeographed.)

were approximately half as frequent. Of the upland birds, the Hungarian partridge was the most commonly sighted by landowners. Pheasants were reported by approximately 50 percent of the landowners. The sightings of sharptail and ruffed grouse were 38.6 and 44.0 percent, respectively. As expected, fewer landowners sighted wildlife species during the winter months of 1973 than during the remainder of the study period. The results indicate that the study area has a wide variety of game species. The area also possess good potential for public hunting. According to the landowners' response, hunters spent an average of 3.4 hours hunting on an individual's land. Landowners were then asked to estimate the number of hunters their land could support, based on the time hunters spent on their property. It was found that the average landowner's property could support approximately 5.2 hunters per week. Only 9.1 percent of the respondents indicated that their land could not support any hunting activity.

By comparing the frequency of sightings to those obtained for the study area in 1971, it is apparent that both duck and deer populations have remained stable over the two year period. However, the populations of all the upland bird species may have decreased. The comparison of the two surveys showed that pheasant, Hungarian partridge and ruffed grouse populations all decreased by approximately 15 percent. For sharptailed

grouse, the decline in population was only 7 percent. The decline in the population of upland birds could be partly attributed to a reduction of habitat in the study area.

The following question was asked to determine the landowners' attitudes towards wildlife: "Do you like to see wildlife on your land?" Approximately 71.5 percent of the respondents "like to very much".[1] An additional 20.5 percent indicated that they "liked" to see wildlife and 5.8 percent were indifferent. Only 2.2 percent of the respondents disliked wildlife on their land. Therefore the majority of the landowners seem to receive some extramarket benefits, largely nonconsumptive in nature, from the presence of wildlife populations. Landowners show a positive interest in wildlife, despite the risks of wildlife damages.

Accessibility to Private Lands for Public Hunting

The extent of the hunter-landowner conflict over access to private lands in the study area was evaluated so that public programs for its resolution could be recommended. Landowners were asked if they allowed hunting with their permission. Of the respondents, 80.3 percent indicated that they would allow waterfowl hunting (Table 6). Only 39.6 percent allow deer hunting, and for upland bird hunting, the percentage was found to

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[1] See Appendix C, Table C-3.

TABLE 6

LANDOWNERS WHO ALLOW HUNTING WITH PERMISSION

Category	Number	Percent of Sample (373)*	Percent of Respondents
Deer Hunting			
Allow	103	27.6	39.6
Do Not Allow	157	42.1	60.4
No Answer	113	30.3	
Upland Bird Hunting			
Allow	116	31.1	44.6
Do Not Allow	144	38.6	55.4
No Answer	113	30.3	
Waterfowl Hunting			
Allow	273	73.2	80.3
Do Not Allow	67	18.0	19.7
No Answer	33	8.8	

* The total number of landowners in the questionnaire sample was 373.

be 44.6.

For the same study area in 1971, the percentage of the respondents who allowed hunting with permission was 58.6 percent for deer hunting; 65.1 percent for upland bird hunting; and 85.9 percent for waterfowl hunting.[1] The percentage of the landowners who allow deer and upland bird hunting had decreased by 19 and 20.5 percent, respectively. For waterfowl hunting, the percentage decreased by only 5.6 percent. The small change in the case of waterfowl is probably due to the high frequency of sightings of ducks and the associated risk of predation damages.

The landowners were classified into two major groups to determine the percentage of private lands open to public hunting. Group A, as discussed earlier, consists of all the landowners who indicated they allowed at least one type of hunting activity on their property with permission. Group B consists of all the respondents who would not allow any hunting on their land even if hunters asked for permission.

This study's results for the two groups of landowners are presented in Table 7. The percentage of the respondents in Group A and B were 80.8 and 19.2 percent respectively. Thus, the majority of the landowners allowed some hunting activity on their land if hunters asked them for permission. Forty percent of the respondents indicated that they permit waterfowl

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[1] See Appendix C, Table C-15.

TABLE 7

THE TYPES OF HUNTING ACTIVITIES LANDOWNERS ALLOW WITH PERMISSION

Category	Number	Percent of Respondents (355) *
Types of Hunting Allowed (Group A)		
Deer, Upland Birds and Waterfowl	71	20.0
Waterfowl and Upland Birds	40	11.3
Waterfowl and Deer	20	5.6
Deer and Upland Birds	3	0.8
Waterfowl Only	142	40.0
Deer Only	9	2.5
Upland Birds Only	2	0.6
Do Not Allow Any Hunting (Group B)	68	19.2
TOTAL	355	100

* Of the total number of landowners in the questionnaire sample (373), 355 responded to the question.

hunting only. However, 20 percent of the respondents would allow deer, upland bird or waterfowl hunters with permission.

The landowners surveyed by Pattison were also classified into the two major groups (Table 8). Of the landowners in this earlier survey, only 13.5 percent of respondents did not allow any hunting with permission (Group B), 40.4 percent allowed all three types of hunting activity and 24.5 percent allowed waterfowl hunting only. A comparison of the results for the two surveys indicates that a trend towards a refusal of hunters is gradual. The number of landowners who did not allow any hunting with permission increased by only 5.7 percent over the two year period. Therefore, landowners are apparently reluctant to completely close their lands to public hunting. On the other hand, landowners are apparently more selective of the types of hunting they will allow with permission. The trend is towards refusing access for deer and upland bird hunting but not waterfowl hunting. Regardless of the actual trend in attitudes, it is becoming more difficult for game hunters to receive permission to hunt on private land.

Pattison stated that "...the most concrete evidence of farmers' opposition to hunting is the posting of farm land against hunting."[1] He reported that in 1971, 139 of the landowners surveyed posted their land against hunters. This represented approximately 30 percent of the private land surveyed

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[1] W.S. Pattison, op. cit., p. 9.

TABLE 8

THE TYPES OF HUNTING ACTIVITIES LANDOWNERS ALLOW WITH PERMISSION, 1971*

Category	Number	Percent of Respondents (673)**
Types of Hunting Allowed (Group A)		
Deer, Upland Birds and Waterfowl	272	40.4
Waterfowl and Upland Birds	87	12.9
Waterfowl and Deer	30	4.6
Deer and Upland Birds	7	1.0
Waterfowl Only	165	24.5
Deer Only	12	1.8
Upland Birds Only	9	1.3
Do Not Allow Any Hunting (Group B)	91	13.5
TOTAL	673	100

* The results for 1971 were calculated from the data collected by W.S. Pattison, "We Raise 'Em - You Shoot 'Em: A Study of Public Hunting on Private Lands" (Edmonton: Alberta Department of Agriculture, Resource Economics Branch, 1973)

** Of the total number of landowners in this questionnaire sample (732), 673 responded to the question.

in the study area. Upon further analysis of this data by this author, it was found that 66.2 percent of the landowners who posted their land allowed some hunting with permission. Although landowners post their property against trespassers, including hunters, it does not imply that they will not allow some hunting if permission is requested.

To counteract the trend towards increased posting against hunters, the Department of Fish and Wildlife distribute "No Trespassing Without Permission" signs. The signs are provided to landowners at no charge. These signs allow the landowner to list his name, telephone number and place of residence directly on the sign. This assists the hunter in locating a landowner so that he can ask for permission to hunt on his land.

In the present study, those landowners who allow some hunting with permission were asked if they would be willing to post this type of sign. Forty-one percent of the respondents agreed with the suggestion.[1] Approximately 35 percent disagreed and the remaining 24 percent were "undecided". Therefore, 30 percent of all the landowners responding to the questionnaire were willing to post signs indicating no trespassing without permission. As discussed earlier, the posting of land against trespass restricts the hunter's activity. It was suggested that this state of affairs could lead to a disrespect for the

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[1] See Appendix C, Table C-4.

landowner's property and property rights. If landowners posted "No Trespassing Without Permission" signs, it could alleviate part of the problem. The posting of this type of sign could encourage hunters to seek the landowner's permission to hunt on his land. This, in turn, would assist landowners in controlling hunter access to private lands.

The above results indicate that the problem of access to private lands for the purpose of hunting in Alberta is not as serious as it is in other provinces and countries. The increasing trend of posting land against trespass as reported by Pattison is a poor indicator of the extent of the conflict. The posting of property is probably a tool used by landowners to control hunter access. It is a means of gaining knowledge about who enters their land. In many cases, the key element for gaining access to private lands is the courtesy of asking permission.

Programs to Alleviate the Hunter-Landowner Conflict and to Encourage the Production of Wildlife on Private Lands

As discussed earlier, the hunter-landowner conflict consists of two integrated problems -- production of, and accessibility to, wildlife populations. If public hunting on private lands is to continue, landowners must be encouraged to produce wildlife for the hunter. In this section of the study the effects of several public programs on these two problems are determined.

The specific programs examined in this study are:

1. A compulsory hunter training program
2. Forcing hunters to hunt on foot.
3. A user fee system.
4. The leasing of hunting rights to private lands.
5. A government subsidy for unimproved land.
6. A habitat improvement program.

The first four programs are basically designed to resolve the program of hunter access to private lands. That is, these programs concentrate on improving access to private lands for the purpose of public hunting. The last two programs are designed to increase the production of wildlife on private lands. Both of these programs concentrate on encouraging landowners to maintain and improve wildlife habitat areas on their land.

A Compulsory Hunter Training Program

One program that could reduce the conflicts between hunters and landowners is the education of the sportsman. Proper educational training could improve the quality, and therefore the conduct, of the sport hunter. The advantages of a hunter training program are illustrated by the situation in Quebec.

In Quebec, hunters are required to complete the Firearms Safety Training Program before they can obtain a hunting license.[1] The program became mandatory as of August 30, 1972.

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[1] E. Corbeil, "Firearms Training -- Benefits and Shortfalls," 38th Federal-Provincial Wildlife Conference Transactions (Ottawa: Information Canada, 1974), pp. 79-83.

The program was instituted in an attempt to reduce the number of hunting accidents within the province and it has been successful.[1] However, the associated benefits of this program offer as much in themselves as the benefit cited above. The reduction of firearm accidents and the improved behavior of hunters has contributed to a better image of game hunters from the public sector's point of view. The Firearms Safety Training Program has been supported and approved by the hunters and the general public of Quebec.

At present, the Alberta Department of Fish and Wildlife offers a hunter training program for hunters in the province. The program operates on a voluntary basis. The Alberta Fish and Game Association has recommended that the hunter training program become mandatory for all first time hunters and hunting violators.[2]

This study attempted to determine some of the attributes of hunter training programs from the landowners' point of view. The landowners who allow some hunting with permission (Group A) were asked to rate their preference for game hunters who had completed the present voluntary hunter training program. Of the respondents, 10.9 percent indicated they would permit only those hunters with a Hunter Training Certificate.[3] An additional 53.8 percent indicated that they pre-

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[1] Ibid.

[2] Alberta Fish and Game Association, op. cit.

[3] See Appendix C, Table C-5.

ferred hunters who had completed the training program. Only 35.3 percent of the respondents were indifferent. For this group of landowners, approximately 65 percent revealed a definite preference for those hunters educated by the hunter training program.

The effect of a compulsory hunter training program on accessibility to private lands was also evaluated. The response to the question was analyzed for the two major groups of landowners, those allowing and those not allowing some hunting with permission (Tables 9 and 10). For Group A, 47.8 percent of the respondents indicated that their willingness to permit hunters on their land would increase if all hunters were forced to complete an extensive hunter training program. Forty-nine percent of the respondents in Group A indicated that the program would not change accessibility to their property. For Group B, 59.3 percent of the respondents indicated the program would not change their attitudes. However, 35.6 percent would increase access for hunters. For both groups of landowners, less than 6 percent indicated that a compulsory training program would have a negative impact on hunter access.

As expected, landowners show a definite preference for trained hunters. The education of hunters on gun handling and hunting etiquette would undoubtedly reduce the risk of property damages and improve the behavior of the hunter in the field. According to the landowners' response, a compulsory

TABLE 9

EFFECT OF A COMPULSORY HUNTER TRAINING PROGRAM ON ACCESS TO PRIVATE LAND FOR GROUP A

Category	Number	Percent of Total (287) *	Percent of Respondents (276) **
Increase Strongly	40	13.9	14.5
Increase	92	32.1	33.3
No Change	134	46.7	48.6
Decrease	2	0.7	0.7
Decrease Strongly	8	2.8	2.9
No Answer	11	3.8	
TOTAL	287	100	100

* Group A consisted of 287 landowners.

** Of the landowners in Group A, 276 responded to the question.

TABLE 10

EFFECT OF A COMPULSORY HUNTER TRAINING PROGRAM ON ACCESS TO PRIVATE LANDS FOR GROUP B

Category	Number	Percent of Total (68)*	Percent of Respondents (59)**
Increase Strongly	9	13.2	15.3
Increase	12	17.7	20.3
No Change	35	51.5	59.3
Decrease	0	0	0
Decrease Strongly	3	4.4	5.1
No Answer	9	13.2	
TOTAL	68	100	100

* Group B consisted of 68 landowners.

** Of the landowners in Group B, 59 responded to the question.

hunter training program could increase accessibility to approximately 44 percent of the landowners responding to the questionnaire.[1]

Forcing Hunters to Hunt on Foot

Another program designed to improve access to private lands is to force or encourage hunters to hunt on foot. This restriction could reduce the risk of property damages, which is a major problem landowners have with hunters. Pattison found that approximately 65 percent of the actual conflicts between landowners and hunters in 1971 were accounted for by three specific problems: gates left open, fences cut or damaged and crops trampled (Table 11). Restricting hunters to hunt on foot could decrease the incidence of these types of conflicts. This approach is a key element of the cooperative program used in Michigan.[2] Under this program, the Williamston Plan, the hunter must park his vehicle in the farmyard and proceed from there on foot.

To determine the effect of his approach in Alberta, landowners were asked if their willingness to allow hunters on their land would change if hunting on private lands was restricted by law to hunters on foot. The majority of the respondents, 56.5 percent, indicated that their willingness

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[1] See Appendix C, Table C-6.

[2] For a complete discussion of the cooperative program used in Michigan see Appendix A.

TABLE 11

TYPES OF PROBLEMS LANDOWNERS HAD WITH HUNTERS IN THE FALL OF 1971

Type of Problem	Number of Times Cited	Percentage of Total
Gates Left Open	25	13.4
Fences Cut or Damaged	32	17.1
Garbage Left Around	8	4.3
Open Pits Left	5	2.7
Crops Trampled	64	34.2
Building or Machinery Damaged	20	10.7
Livestock Injured or Killed	20	10.7
Miscellaneous	13	6.9
TOTAL	187	100

Source: W.S. Pattison, "We Raise 'Em - You Shoot 'Em: A Study of Public Hunting on Private Lands" (Edmonton: Alberta Department of Agriculture, Resource Economics Branch, 1973), Table 6, p. 15.

would increase.[1] Approximately 39.2 percent would not change their willingness.

The effect of such a program on the two groups of landowners are summarized in Tables 12 and 13. As expected, Group A responded more favourably to the program then Group B. For the landowners in Group A, 62.7 percent of the respondents indicated that their willingness would increase. Only 25.5 percent of the landowners in Group B would be effected favorably by the program.

Landowners prefer that hunting on private lands be restricted to hunters on foot. The adoption of this system could increase access to approximately 56 percent of the total landowners. The program would have a greater positive effect on access than a compulsory hunter training program. However, if both of these programs were instituted, they could increase access to 66 percent of the private landowners in the study area. These results indicate that the landowners' attitudes on access can be significantly changed by instituting programs that reduce the risk of property damages.

User Fee System

One method of compensating landowners that allow hunting is to adopt a user fee system. Under this system, hunters would pay the farmer for the privilege of hunting on his land. Forty-five percent of the respondents felt that landowners should be compensated in some form if they allow public hunting

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[1] See Appendix C, Table C-7.

TABLE 12

EFFECT OF FORCING HUNTERS TO HUNT ON FOOT ON THE LANDOWNERS IN GROUP A

Category	Number	Percent of Total (287)*	Percent of Respondents (276)**
Increase Strongly	75	26.1	27.2
Increase	98	34.2	35.5
No Change	92	32.1	33.3
Decrease	3	1.0	1.1
Decrease Strongly	8	2.8	2.9
No Answer	11	3.8	
TOTAL	287	100	100

* Group A consisted of 287 landowners.

** Of the landowners in Group A, 276 replied to the question.

TABLE 13

EFFECT OF FORCING HUNTERS TO HUNT ON FOOT ON THE LANDOWNERS IN GROUP B

Category	Number	Percent of Total (68)*	Percent of Respondents (55)**
Increase Strongly	4	5.9	7.3
Increase	10	14.7	18.2
No Change	38	55.9	69.1
Decrease	2	2.9	3.6
Decrease Strongly	1	1.5	1.8
No Answer	13	19.1	
TOTAL	68	100	100

* Group B consisted of 68 landowners.

** Of the landowners in Group B, 55 replied to the question.

on their land.[1] Only 23 percent disagreed and the remaining 32 percent of the respondents indicated "no opinion." The percentage of the respondents who agreed with a user fee program for deer, upland birds and waterfowl hunting was 40.4, 38.1 and 29.1 percent, respectively (Table 14). Fewer landowners favored a user charge for waterfowl hunting than for the other two types of hunting activity. This greater reluctance on the part of the landowners may in part reflect the fact that hunting is an effective method of preventing crop damages caused by ducks and geese.

Upon aggregation of the data, the author found that 41.6 percent of the landowners responding to the question were in favor of a user charge for at least one of the three types of hunting activity.[2] Therefore, the majority of the respondents, 58.4 percent, were opposed to a user charge for any of the three types of hunting.[3]

Earlier in the study, landowners were classified according to the types of hunting they allowed with permission (Table 6). For each form of hunting, there were three possible classes: (1) allow hunting with permission, (2) do not allow

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[1] See Appendix C, Table C-8.

[2] It was found that 132 landowners favored a used fee system for at least one type of hunting. This represents 35.4 percent of all the landowners in the sample.

[3] The average user fee per hunter per day expected by those landowners in favor of the system was as follows: $13.67 for deer hunting; $9.47 for upland bird hunting; and $9.14 for waterfowl hunting. For each type of hunting activity, the fee ranged from $1 to $50 per hunter per day.

TABLE 14

ATTITUDES OF LANDOWNERS TOWARD A USER FEE SYSTEM FOR HUNTING

Category	Number	Percent of Sample (373)*	Percent of Respondents
For Deer Hunting			
Agree	111	29.7	40.4
Disagree	164	44.0	59.6
No Answer	98	26.3	
For Upland Bird Hunting			
Agree	104	27.9	38.1
Disagree	169	45.3	61.9
No Answer	100	26.8	
For Waterfowl Hunting			
Agree	86	23.1	29.1
Disagree	210	56.3	70.9
No answer	77	20.6	

* The total number of landowners in the questionnaire sample was 373.

hunting with permission, (3) no answer. To determine the effect of the user charge system on access, the number of landowners in favor of the program in each of the above classes was calculated. The results are presented in Table 15. Of the landowners who allow deer hunting with permission, 23.3 percent were in favor of charging for that privilege. Of the landowners who do not allow deer hunting with permission, 39.5 percent favored a user fee for deer hunting. For the "no answer" group, 22.1 percent agreed that deer hunters should pay a user fee to the landowner. For each of the three forms of hunting, the same trend in attitudes occurs. Those landowners that allow hunting with permission are more reluctant to charge a user fee than those landowners who do not allow hunting with permission. A user fee system could encourage landowners to allow hunting on their land.

The effect of a user fee system on increasing the number of landowners who would allow public hunting on their land was calculated. It was found that 27.6 percent of all the landowners surveyed allowed deer hunting with permission.[1] If landowners were given the option of charging for deer hunting, it could increase this percentage to 50.9. This assumes that the original groups of landowners who allow deer hunting with permission would not reverse their attitude. A user fee program could increase the number of landowners who would allow

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[1] See Table 6.

TABLE 15

LANDOWNERS' RESPONSE TO A USER FEE SYSTEM
ACCORDING TO THE TYPES OF HUNTING THEY PERMITTED

Category	Number	Landowners Favoring a User Fee	
		Number	Percent of Group
Deer Hunting			
Allow	103	24	23.3
Do Not Allow	157	62	39.5
No Answer	113	25	22.1
Upland Bird Hunting			
Allow	116	27	23.3
Do Not Allow	144	51	35.4
No Answer	113	26	23.0
Waterfowl Hunting			
Allow	273	55	20.1
Do Not Allow	67	19	28.4
No Answer	33	11	33.3

upland bird hunting from 31.1 to 51.7 percent. For waterfowl hunting, the increase in percentage would be approximately 8.0 percent. Therefore, the monetary benefits of a user charge system could substantially increase access, especially for deer and upland bird hunters.

However, this system would not greatly encourage the development of wildlife habitat on private lands. Approximately 37 percent of the landowners who were in favor of the user charge for at least one type of hunting indicated that the system would increase their willingness to develop suitable habitat on their property.[1] This represents only 12.3 percent of the total landowners sampled.

The results indicate that a user fee system could increase access to private lands. According to the average user fee expected by landowners, it is questionable whether this program would be successful in Alberta. From the aspect of development of habitat on private lands, a user fee system could only have a marginal effect.

Leasing of Hunting Rights

Another method of compensating landowners is to permit the leasing of hunting rights. Under this policy, hunters pay the landowner an annual fee for the exclusive right to hunt on his land. The leasing fee would depend on the acreage and the hunting potential of the farmer's land. This policy

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[1] See Appendix C, Table C-9.

is common in many European countries, most notably West Germany.[1]

Of the landowners who responded to the question, 8.2 percent were willing to lease their deer hunting rights to individuals or groups of hunters.[2] The percentage of the respondents in favor of leasing their rights for upland bird and waterfowl hunting was 6.3 and 14.8 percent, respectively. Landowners were also asked if they would lease their hunting rights to hunting clubs. For all three forms of hunting activity, less than 9 percent of the respondents agreed.[3] The results are conclusive. The leasing of hunting rights to private lands is not generally acceptable to Alberta's landowners.

Government Subsidy for Unimproved Land

The Alberta Fish and Game Association has recommended to the Provincial Government that landowners who effectively protect, retain or create wildlife habitat areas should be compensated.[4] They proposed that the compensation program might take the form of a tax credit or grant system. This association suggested that the term of such a program be at least five years and that it should include areas of slough, bluff or stream bank set aside from agricultural use.

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[1] See Appendix A for a complete discussion of the leasing of hunting rights in West Germany.

[2] See Appendix C, Table C-10.

[3] See Appendix C, Table C-11.

[4] E. Kure, "Land Use in Alberta" (Edmonton: Alberta Fish and Game Association, 1975), p. 10. (A report presented at the Alberta Land Use Hearings.) (Mimeographed.)

A similar compensation program is used in Vermont for timber land management.[1] Under this scheme, state agencies pay the taxes on private timber lands in return for the hunting rights on the land. The state manages the wildlife, the habitat and the public use of the area. The landowner is also relieved of liability from damage suits. The owner retains the timber rights but he must pay a severance tax when he harvests the timber.

In the present study, landowners were asked if they favored a government subsidy, such as a permanent easement or tax rebate, for unimproved land used by wildlife. Of the respondents, 36.9 percent "agreed strongly" and an additional 31.1 percent "agreed" with the proposed program.[2] Nineteen percent were "undecided" and only 13 percent disagreed. An omission error in the questionnaire design prevented the author from determining the dollar value of the subsidy landowners expected to receive.[3]

Of the landowners who favored the government subsidy, 40.9 percent indicated that the program would increase their

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[1] H.D. Johnson, "A Study of Organized Efforts to Improve Landuser-Sportsmen Relations for the Purpose of Maintaining Public Upland Game Hunting" (unpublished M. Sc. Thesis, Utah State University, Logan, 1966), p. 48

[2] See Appendix C, Table C-12.

[3] In the questionnaire, the unit of time for the proposed government subsidy was not specified. Therefore, it was not possible to determine the amount of subsidy landowners expected to receive for maintaining unimproved land used by wildlife.

willingness to allow hunters on their land.[1] For the same groups of landowners, 43.9 percent indicated that this program would encourage them to allow portions of their land to return to its natural state.[2]

The effects of a government subsidy program are summarized below. The calculations are based on the total number of landowners in the survey sampled.

1. Of the landowners, 56.3 percent would maintain wildlife habitat on their land.
2. The subsidy would encourage 22.3 percent of the landowners to increase their willingness to permit hunters on their property.
3. The subsidy could encourage up to 23.9 percent of the landowners to create new habitat on their land.

As outlined above, a government subsidy for unimproved land has three distinct effects, all of which could contribute to resolving the hunter-landowner conflict.

Habitat Improvement Program

Habitat improvement programs attempt to enhance the quality and quantity of wildlife habitat. In Alberta, the Provincial Government provides some technical advice for the development and improvement of habitat on private lands. In

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[1] See Appendix C, Table C-13.

[2] See Appendix C, Table C-14.

some cases, they may also provide free planting materials.[1] However, few landowners actually request and receive shrubs and trees for planting.[2]

The loss of habitat on private lands in Alberta inhibits the conservation of wildlife resources. A major habitat improvement program could significantly enhance populations in the province. The program could also encourage landowners to increase access to private lands. Landowners may be more willing to permit hunters on their land if they know that game populations are not scarce. This assumption is based on the fact that a large number of landowners may oppose hunting activity because they believe it reduces wildlife populations (see Table 3).

To determine the effectivenenss of this approach, landowners were asked if they would be willing to work with the Department of Fish and Wildlife to develop their unimproved land for wildlife. Forty-nine percent of the respondents agreed with the proposal. (Table 16). Approximately 29 percent were "undecided" and 22 percent of the respondents "disagreed".

Since the plurality of the landowners favor a habitat improvement program, this program could significantly enhance the populations of wildlife on private lands. However, unlike a permanent easement system, a habitat improvement program

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[1] Personal Communciation with Dave Neave of the Alberta Fish and Widlife Division, Edmonton, August 22, 1975.

[2] Ibid.

TABLE 16

LANDOWNERS' RESPONSE TO A HABITAT IMPROVEMENT PROGRAM ON PRIVATE LANDS

Category	Number	Percent of Sample (373)*	Percent of Respondents (309)**
Agree Strongly	63	16.9	20.4
Agree	88	23.6	28.5
Undecided	90	24.1	29.1
Disagree	54	14.5	17.5
Disagree Strongly	14	3.7	4.5
No Answer	64	17.2	
TOTAL	373	100	100

* The total number of landowners in the questionnaire sample was 373.

** Of the total number of landowners, 309 responded to the question.

cannot guarantee that landowners will maintain improved habitat areas over time.

Each of the six programs discussed above, except for the leasing of hunting rights, could have an important impact on hunter access and the production of wildlife on private lands.[1] Taken collectively, these programs could significantly improve these problem areas. What is needed is an integrated public policy to facilitate such improvements.

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[1] One source of distortion of results may arise from the fact that landowner's holdings may vary in size and that there may be an increasing number of non-resident landowners. Allowance for these problems is difficult and may not in any way alter the results of this study.

CHAPTER IV

SUMMARY AND POLICY RECOMMENDATIONS

The hunter-landowner conflict consists of two interrelated problems: (1) hunter access to game populations and (2) the production of wildlife on private lands. One underlying premise of this study is that present government policies do not permit an equitable distribution of the costs and benefits from wildlife resources that accrue to members of society. This state of affairs leads to an imbalance of property rights, which creates problems for the conservation of wildlife on private lands. Resolution of the hunter-landowner conflict requires a set of programs that adhere to the landowners' interests and encourages the production of wildlife. The present study has provided insight into alternative programs that could be used to resolve the conflict.

The results of this study indicate that the problem of hunter access to private land in Alberta is not as serious as has been reported in some areas in Europe or United States. However, the problem is intensifying and it will undoubtedly continue to do so in the future if the situation is not rectified. Public programs should be instituted as soon as possible to prevent further closure of private lands to sport hunters. Present action will be more effective and economical because at present landowners can be encouraged to increase access to hunters. If the decision to act is prolonged intensification of the problem may severely limit hunting on private land in

the future. The problem of hunter access may reach the point of irreversibility.

The results of this study indicate that several programs could be instituted to counteract the problem. Of foremost importance is a compulsory hunter training program. This program should be instituted in Alberta. The training program should concentrate on improving the conduct of the sport hunter. Educating hunters on conservation principles, gun handling and proper hunting etiquette is essential. This will promote better sportsmanship among hunters and may significantly reduce property damages incurred by landowners.

A hunter training program should also stress the private landowners' problems and interests. In this respect, the program should promote two concepts brought forth by this study.

1. Hunters should hunt on foot. Hunting on foot reduces the risk of property damages as well as the landowners' opposition to hunting activity.
2. Hunters should always ask permission to hunt on private lands. This is a common courtesy that will permit the landowner to know who is entering his land.

A hunter training program must encourage hunters to repsect landowners' property rights. This program will serve as the key element for resolving the problem of access to private lands. For this reason, the hunter training program should be compulsory for all hunters in Alberta.

To reinforce and complement the effects of a hunter training program, the following programs are recommended.

1. To encourage hunters to ask permission to hunt on private lands, government agencies should promote the distribution of the proposed "No Trespassing Without Permission" signs. These signs will assist the hunter in locating the landowner.
2. The Provincial Government should also distribute safety signs to the landowner at no charge. These signs would be erected by the landowner around all occupied buildings to ensure greater safety.
3. The enforcement of hunting regulations should be improved. Increased enforcement of hunting activities would promote better conduct among hunters and at the same time, it would assist landowners in controlling hunters on their property.
4. The Provincial Government should encourage the development of public shooting preserves. Hunting preserves near urban centers would assist in reducing hunting pressures in open areas (see Appendix A).[1]

The above recommendations will not completely resolve the problem of access to private lands, but they may prevent the problem from reaching the point of irreversibility. The success of these programs cannot be determined because their total effect will depend upon the resolution of the second problem

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[1] This issue was not discussed in the text of this study. However, the advantages of shooting preserves were outlined in Appendix A.

of the hunter-landowner conflict-- the production of wildlife on private lands.

To resolve this problem, private landowners must be encouraged to create, maintain and improve habitat on their property. The results of this study indicate that, in general, landowners are willing to conserve wildlife on their land. The majority of the landowners favoured a subsidy for unimproved land and a habitat improvement program. Both of these policies could enhance the production of wildlife on private lands.

A permanent easement or other incentive schemes for unimproved land could encourage landowners to maintain habitat areas.[1] This program could also result in the creation of new habitat areas. A subsidy program, however, may not encourage landowners to improve habitat areas to make them more suitable for wildlife. A habitat improvement program, on the other hand, is designed to improve the quality of existing habitat. This program, in turn, does not provide an incentive for the landowner to maintain areas that have undergone improvement. Neither program by itself can guarantee success.

It is therefore recommended that both of these programs, a government subsidy and a habitat improvement program, be adopted. That is, these two programs should be used together to formulate one policy for the enhancement of wildlife on private lands. Under this policy, landowners may receive a subsidy for

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[1] One may argue that ideally benefactors, including hunters and landowners, pay for the cost of habitat commensurate with the proportion of the benefits received by each beneficiary. A program to fulfill this objective is most likely not feasible. However, a program to subsidy that recognizes the incidence of benefits and costs as much as possible may be most appropriate.

maintaining habitat areas and/or financial assistance for improving the quality of existing habitat on their land. If a landowner applies for assistance under this program, his unimproved land should be assessed for:

1. The land's present capacity for producing wildlife.
2. The land's potential capacity for producing wildlife if the quality of the existing habitat is improved.
3. The relative importance of the land for wildlife in relation to the surrounding area's ecological features.

The type of assistance that this policy will provide to the landowner will be based on assessment of these variables. That is, the relative productive capacity of the farmer's land for wildlife will determine whether or not he will receive assistance and the actual form of the assistance. Under this approach, the incentive for improving, creating or maintaining habitat areas will vary with the elements of the situation. This policy attempts to improve and/or maintain habitat areas in order of their relative importance. What is desired is a flexible policy that can efficiently enhance the production of wildlife. To be efficient, the policy must attempt to achieve the maximum production of wildlife per unit of cost. The policy outlined above may encourage landowners to produce wildlife resources on their lands.

The hunter-landowner conflict in Alberta is not simple; it involves many interrelationships and obstacles. Therefore, resolution of the problem requires a set of well

designed and coordinated programs. The recommendations from this study are based on the attitudes and interests of the landowners in the east central part of Alberta. As such, they may not be completely applicable to the entire province because the elements of the conflict and the attitudes of the landowners may vary with location. However, the program may serve as a guideline for developing policies to alleviate the conflict throughout Alberta. These recommendations may not completely resolve the problems of the hunter-landowner conflict, but they may prevent the conflict from intensifying.

It is also questionable whether the programs will receive the approval of all the parties involved. This study did not determine the attitudes of other entities in society towards the proposed programs. The adoption of these recommendations by society will depend on several factors which include the method of funding and the method of instituting the programs. It is beyond the scope of this study to evaluate the effects of these factors because, by and large, they are determined by the political decision making process. This study only provides insight on the elements of the hunter-landowner conflict and on possible methods of alleviating the problem

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APPENDIX A

POLICIES USED IN OTHER COUNTRIES TO RESOLVE THE HUNTER-LANDOWNER CONFLICT

Policies Used In Other Countries To Resolve The Hunter-Landowner Conflict

The hunter-landowner conflict is not unique to Alberta. Similar access problems are common in other countries. And there does not seem to be a unique solution. A variety of programs and policies have been developed and instituted in an attempt to resolve the conflict.

This section describes four general types of approaches that have been attempted. A short description of each policy, its application, advantages and shortcomings will be undertaken. A study of different management techniques may be beneficial in providing the policy guidelines necessary to resolve public access problems in Alberta.

Shooting Preserves

The scarcity of wild game and the closure of private lands by posting have contributed to the growing popularity of shooting preserves in the United States. Shooting preserves are defined by the National Shooting Sports Foundation as:

> ...privately owned and operated areas on which pen-raised game is released for hunting, usually upon payment of a fee by shooters. The term shooting preserve implies in most instances that there is an extended season longer than regular statewide season, that there is no bag limit on released game, and that the areas are licensed or sanctioned by State Game Commissions.[1]

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[1] C. Dickey, Shooting Preserve Management (New York: Sportsmen's Serv. Bur., 1960), as cited in L.J. Kouba, "Controlled Shooting Preserves: Integrating Recreation and Sound Land Management," Journal of Soil and Water Management, Vol. 27, No. 4 (1972), p. 157.

Although each preserve may vary in actual structure, there are two broad classifications: commercial and private shooting preserves.[1] Commercial preserves are a business venture, operated for a profit. In a private preserve, a small number of sportsmen buy or lease the hunting rights to an acreage and limit hunting to members only. In 1960, preserves open to the public were predominant, by a 3 to 1 ratio.[2] The first licensed preserve was established in New York in 1911. By 1970, the total number had risen to 2,525.[3] Alaska and Idaho were the only states where shooting preserves were not legalized.

The most commonly used game are upland birds, most notably, the ring-necked pheasant. Shooting preserves that are open to the public generally charge a daily fee that varies with the facilities and services provided. Regulations governing shooting preserves are established by the state and they may include a maximum acreage size, a maximum recovery rate on released birds, an extended season and the purchase of a state operating license.

Shooting preserves provide an opportunity to supply the future needs of sportsmen at no expense to existing wildlife populations. They also aid in reducing hunting pressures

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[1] Ibid., pp. 157-158.

[2] U.S. Department of Agriculture, Economic Research Service, Private Outdoor Recreation Facilities: A Report to the Outdoor Recreation Resources Review Commission, Report No. 11 (Washington, D.C.: U.S. Government Printing Office, 1962), p. 40.

[3] L.J. Kouba, op. cit., p. 157.

in open areas. A shooting preserve can be integrated with farming operatings and thus may represent an added source of income to the landowner.[1] Since preserves generally adhere to sound land use practises, they contribute to the conservation of habitat and other non-game species. Shooting preserves permit the transformation of potential technological externalities into pecuniary externalities. With such a free enterprise system, the market forces dictate the number of preserves in an area and ensure that only those properly managed remain viable. A competitive market system is generally recognized as an inexpensive mechanism for allocating resources with reasonable efficiency.

Habitat Improvement Programs On Private Lands

Various public programs have been instituted to improve wildlife habitat on private lands. For example, most state agencies provide technical bulletins and information to landowners regarding the proper development of suitable wildlife habitat areas. Some agricultural conservation programs provide planting materials to enhance habitat without cost to the landowners. Kentucky, Louisiana, Kansas, Mississippi and Idaho have adopted habitat improvement programs but the results are generally unsuccessful.[2]

[1] Ibid., p. 159.

[2] J.P. Hedlin and R. Hedlin, op. cit., pp. 13-30.

Evaluation of various planting programs in Kentucky indicated that there was very little evidence that wildlife enhancement goals were being achieved. Results revealed that only 30 percent of the plants and shrubs provided were ever planted.[1] A special study of landowners' acceptance of wildlife habitat improvement practises in Kentucky estimated that it took 1,114 contacts to secure one landowner for habitat improvement planning.[2] Furthermore, nine such cooperators were required to produce one successful improvement plan. Kentucky game officials summarized their efforts as follows:

> It has become obvious that providing technical plans, giving away plant materials and the agricultural wildlife programs as now applied do not provide sufficient incentive to landowners to cause them to practise habitat improvement. We have been through the various programs and find that they actually accomplish very little in the way of wildlife benefits.[3]

For this reason, many states, including Kentucky, have discontinued this type of program.

The results of state habitat improvement programs in the United States were evaluated as follows:

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[1] Alberta Department of Lands and Forest, Fish and Wildlife Divison, Wildlife Management Systems on Private Lands in Alberta, Technical Report No. 2A (Edmonton: Alberta Land Use Forum, 1974), p. 10.

[2] R. Hornsby, J. Bruna, R. Eversole, and R. Kessler, "Wildlife in Kentucky Agricultural Programs," 27th North American Wildlife Conference Transactions (Washington, D.C.: Wildlife Management Institute, 1962), pp. 202-212.

[3] Ibid., pp. 210-211.

> There is a trend away from massive far-flung planting programs because of the excessive cost and the inability to show clearly that the results were very beneficial to game. It is not that cover and food planting can't be beneficial, but that they have to be made in the right locations and in relation to the ecological features of the area and its game, as well as to prevailing farm practises. Finally, too few farmers had the interest to care for the plantings after they were in, and there was not much relief from posting.[1]

Although the state controls wildlife populations, the development and maintenance of habitat on private lands is controlled by the landowners. Habitat improvement programs will succeed only if the landowner develops an interest in wildlife and cooperates in its management. The lack of success of past programs is directly attributed to the absence of automatic benefits for the landowner. It has been suggested that a monetary incentive must be provided. Others suggest that habitat programs must be complementary to the primary land use.[2] That is, private improvement programs must be beneficial to the farming operation and contribute directly to the landowner's production potential. It is safe to assume that if sound advice is provided, the landowner's cooperation will be obtained.

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[1] Department of Conservation, School of Natural Resource, University of Michigan, Hunting in the United States-Its Present and Future Role: A Report to the Outdoor Recreation Resources Review Commission, Report No. 6 (Washington, D.C.: U.S. Government Printing Office, 1962), p. 15.

[2] J.H. Berryman, "The Responsibility of State Agencies in Managing Hunting on Private Lands," 26th North American Wildlife Conference Transactions (Washington, D.C.: Wildlife Management Intitute, 1961), pp. 285-297. (In Discussion.)

Cooperative Landowner Programs

A cooperative landowner program is basically a mutual agreement between landowners, sportsmen and management agencies that is instituted to alleviate the problems of the hunter-landowner conflict. Each cooperative program is unique, being designed for a specific area and its situation. Therefore, there is no standard format. All cooperatives, however, seek the same objectives: (1) improve the trespass problem, (2) control hunting pressure, and (3) open private lands to public hunting.

A cooperative may be free or paid. Michigan, Pennsylvania, Washington and Ohio are states where free access is emphasized. These "access with permission" programs are an extension of public relations policies. In essence, the sportsman obtains permission to hunt on private lands with no additional personal costs.

Some rural communities form a cooperative to charge a fixed price for access to farm lands. The collected funds are generally used for community projects or to cover the operational costs of the program.

The success of cooperatives varies with location. Some successful forms of cooperatives, instituted in other areas or states, have resulted in complete failure. The program must be unique to the area's immediate needs if it is to succeed.

Most cooperative landowner schemes are modelled after the Williamston Plan that has been used in Michigan since 1929.[1] This program involves cooperative posting of private lands and admittance of hunters by written permission only. A cooperative is formed by adjoining farms forming a block which contains between 1,000 and 10,000 acres.[2] The number of permits allowed each farm member is determined at an annual meeting of the landowners. The number of permits issued is limited so that hunting pressures can be controlled on a particular piece of property at any one time.

To hunt, the sportsman must obtain a permit ticket from a landowner, which generally allows access to the cooperative area. Once the permit is procurred, the hunter must park his vehicle in the farmyard and proceed from there on foot. Hunting on foot aids in spreading the hunters more evenly throughout the area. With his vehicle in the landowner's yard, the hunter knows he will be held responsible to the owner for his conduct. Under this system, the landowner has direct control over the hunters on his property and he has the added advantage of being able to refuse access.

A similar plan in Pennsylvania has restored more than

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[1] H.D. Johnson, op. cit., pp. 23-26.

[2] Howard Paish and Associates, Limited. op. cit., p. 59.

four million acres of private lands to public use.[1] Under this program, "safety zone" signs are also erected around all occupied buildings to promote greater safety for landowners. The landowner provides only the land for hunting and he retains complete ownership. In return, he receives advice on soil conservation and on other profitable farm practises. Game officials are paid to patrol and enforce all regulations under the program. The program also supplies some planting materials. No direct monetary incentives are contributed to the landowner.

A cooperative program as described above was instituted in the Abbortsford area of British Columbia for several years.[2] A shift in the hunting pressure resulted in deteriorating relationships and conflicts between the parties. The program was replaced by a permit entry system. Permits are sold at a charge of one dollar per season. Permits must be counter-signed by a landowner before becoming valid. The fee is used to cover the cost of permits and signs and to employ a part-time patrol officer. The program covers approximately 6,000 acres and during the 1972-73 season, 1,100 permits were issued. To qualify for a permit, the sportsman must be a

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[1] C.H. Stoddard and A.M. Day, "Private Lands for Public Recreation: Is There a Solution?" 34th North American Wildlife and Natural Resources Conference Transactions (Washington, D.C.: Wildlife Management Institute, 1969), p. 189.

[2] Howard Paish and Associates, Limited, op. cit., pp. 61-64.

member of the British Columbia Wildlife Federation club.

> Local police and municipal authorities have expressed satisfaction with the operation of this system and remarked on the lack of hunter complaints received since it went into effect. Landowners apparently find it a desirable development also.[1]

The cooperative program in the Abbortsford district has succeeded because of the distinct elements of the situation. The program is flexible and it has been altered according to current conditions.

Cooperative landowner programs, although quite popular, have distinct disadvantages:

1. Many programs are not designed to include the enhancement of wildlife populations on private lands.
2. Cooperatives are difficult to initiate and they often fail if the prevailing conditions of the problem change.
3. Many cooperatives limit the number of hunters in their area.

Cooperative programs improve trespass problems in areas which experience heavy hunting pressure. Under this condition, the services provided by a cooperative program, which must include enforcement, become an incentive to the landowner. Providing protection for the landowner is one of the most acceptable methods of obtaining his cooperation. Once the landowner is protected, he may be positively interested in managing wildlife.

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[1] Ibid., p. 62.

Commercial Hunting Systems

There is a growing trend toward permitting landowners to charge a fee for the privilege of hunting on private lands. The two generally accepted agreements under this policy are:

1. Leasing the exclusive hunting rights of an area to individuals or hunting clubs.
2. Payment of an access fee to landowners; directly charging hunters a daily fee.

A brief description of two specific cases will be used to illustrate this concept.

The Leasing of Hunting Rights

Many European countries have adopted game management policies similar to those used in West Germany. In the strictest legal sense, the wildlife of West Germany are the property of the state and are held in trust for all the people.[1] However, the landowner's relationship with the game is fully recognized. Therefore, under this system, the right to hunt and all wildlife management responsibilities are vested in the ownership of the land. Furthermore, the landowner has a legal right to lease the hunting rights of his property.

All the land in West Germany, whether private or public, is divided into hunting districts or reviers.[2] Reviers may be owned by one individual, the state or established through a

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[1] J.S. Gottschalk, "The German Hunting System, West Germany, 1968," Journal of Wildlife Management, Vol. 36, Part 1 (1972), pp. 110-118.

[2] W.L. Webb, "Forest Wildlife Management in Germany," Journal of Wildlife Management, Vol. 24 (1960), pp. 147-161.

mutual agreement of adjoining landowners. All hunting must take place on a revier. In 1968, there were 37,000 reviers in Germany, of which only 1,5000 were state owned.[1] The acreage size of a revier is controlled by the state to ensure that lands are combined into viable management units. On the average, a revier contains approximately 1,650 acres. The hunting rights of a revier are leased directly by the landowner to hunting clubs for an annual fee, which could be valued up to 5,000 dollars per year.[2] A lease for small game hunting extends for a minimum of nine years. For big game hunting, the minimum term for a lease is twelve years. In contrast, the leasing of reviers in Poland is set by the state.[3]

Before a hunter can lease the rights to a revier in Germany, he must obtain a hunting license. To qualify for a license, the sportsman must complete a hunter training course. The course required approximately 100 hours of study.[4] Upon completion, the applicant must pass both written and oral examinations that include "target shooting on clay pigeons and rifle shooting, knowledge of the biology of game, gun dogs, wildlife management, conservations of nature and hunting laws

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[1] J.S. Gottschlk, op. cit.

[2] Ibid.

[3] R.D. Taber, "Wildlife Administration and Harvest in Poland", Journal of Wildlife Management, Vol. 25 (1961), pp. 353-363.

[4] J.S. Gottschlk, op. cit.

and regulations."[1] In 1967, 37 percent of the applicants failed to pass the required tests.[2]

The game management policies in West Germany limit the number of hunters in the country.

> The principle limitation is economic, since in order to qualify for hunting, one must have mastered not only the legal and traditional requirements of skill and knowledge, but also have access to a place in which to hunt. To have a revier requires not only the economic capacity to buy or lease a hunting area, but also an acceptance of the responsibility for the welfare of the game and for the protection of landowners, including those adjacent landowners who may be subject to crop depredations.[3]

For each revier, there must be an annual inventory of game and a harvest plan approved by the state agencies. The annual harvest is based on the production capacity of the revier and the condition of the game. There are no conventional bag limits. All the game harvested are the property of the revier owner. In most cases, the meat and hides are sold in public markets and restaurants. The market value of the 1966 harvest was approximately 1.6 million dollars.[4]

Under this policy, the right to hunt is held by the landowner and it is therefore priced. The direct monetary returns provide the landowner with an incentive to maintain

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[1] J.P. Hedlin and R. Hedlin, op. cit., p. 23.

[2] J.S. Gootschlk, op. cit.

[3] Ibid., p. 111.

[4] Ibid.

and develop wildlife on his property. The landowner's profit can be increased if he manages his resources to enhance game populations. The hunter is also compelled to encourage wildlife surpluses if quality hunting is desired over the entire leasing period. Each party's profit or utility is enhanced if the optimal output of game is produced. If the property rights to use wildlife are established, the market system will dispel the complexities between uses and users of the resource

Access Fees

The practise of charging a fee to hunt on private lands is a well accepted fact in Texas. It is virtually impossible to hunt any species of big game and many small game species in that state without paying a trepass, hunting, or landuse fee.[1] This approach evolved in the 1920's because of the lack of public lands.[2] Although the state legally owns the wildlife, the existing trespass law enables the landowners to control access to the game. To prevent severe conflicts, landowners are legally permitted to charge access fees or to lease their hunting rights.

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[1] K.E. Severson and F.R. Gartner, "Problems in Commerical Hunting Systems: South Dakota and Texas Compared," Journal of Range Management, Vol.25 (1972), pp. 342-345.

[2] J.G. Teer and N.K. Forrest, "Bionomic and Ethical Implications of Commerical Game Harvest Programs," 33rd North American Wildlife and Natural Resource Conference Transactions (Washington, D.C.: Wildlife Management Institute, 1968); pp. 192-204.

Four general types of leasing agreements are used: (1) a season lease, (2) a charge per hunter day, (3) a hunting outfitter, and (4) a charge per animal harvested.[1] The most common arrangement is the "season lease". A season lease gives a group of hunters the exclusive hunting privileges for specific game species.

Landowners who charge for hunting must purchase a shooting preserve license and record the details of all game animals shot.[2] Landowners must also certify that all hunting is done legally. Game harvest quotas are established by the landowner in accordance with state regulations.[3] In return, state wildlife officers ensure that the trespass without permission regulation is enforced. Landowners have complete control over hunter numbers. Teer and Forrest state that "each landowner literally acts as his own conservation officer."[4]

As with the European system, landowners receive an economic return from wildlife populations. Klussmann reported that 13,000 Texas landowners leased 22 million acres of land

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[1] For a complete description of each type of leasing agreement, see J.G. Teer and N.K. Forrest, op. cit.

[2] J.P. Hedlin and R. Hedlin, op. cit., p. 31.

[3] J.G. Teer and N.K. Forrest, op. cit.

[4] J.G. Teer and N.K. Forrest, op. cit., p. 200.

for public hunting in 1965.[1] The income collected by landowners from leases amounted to 13 million dollars. These returns are a strong stimulus that probably promote the development of game throughout Texas.

The attributes of the commerical hunting system in Texas were summarized as follows:

> The commerical hunting program in Texas have been a great stimulus to production of game. Undoubtedly, more big game is now available to the hunters because of the economic value of game to the landowner. Hunting leases have promoted hunter safety and distributed hunters more evenly over ranges having huntable populations of game. They have resulted in lower illegal kills, and more circumspect conduct by hunters on private lands.[2]

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[1] W.G. Klussmann, "Deer and the Commercialized Hunting System in Texas," Proceedings: The White-Tailed Deer: Its Problems and Potentials (Texas: Texas A and M University, 1966), pp. 18-21.

[2] J.G. Teer and N.K. Forrest, op. cit., p. 203.

Summary

Private agricultural lands are an important but unrealized potential for wildlife management and public recreation. Different public policies have attempted to remove the obstacles of public access and to resolve the problem of trespass. The literature suggests that none of these policies have successfully eliminated the trend of "No Trespassing" signs and completely reversed the attitudes of landowners.

It is clear that no suggested policy to date guarantees success. Nor can it be expected that these policies will meet with instant and universal approval. However, if public hunting is to continue, landowners, hunters and wildlife officials must be prepared to modify some of their traditional attitudes and programs. The policies discussed above may supply the necessary guidelines.

APPENDIX B

SURVEY QUESTIONNAIRES

1971 100

CONFIDENTIAL

WILDLIFE QUESTIONNAIRE

1. Location of Farmstead or Acreage ¼ _____ Sec. _____ T. _____ Rge. _____

2. Are you living on your farm property or acreage? Yes _____ No _____ If Yes, how many years have you lived there? _____

3. Please check (√) which of the following birds and animals you have seen on your property during the past year.

Pheasants	_____	Sharptail Grouse		Rabbits	_____
Hungarian Partridge	_____	(Prairie Chicken)	_____	Ducks	_____
Ruffed Grouse		Whitetail Deer	_____	Geese	_____
(Bush Partridge)	_____	Mule Deer	_____		

4. Please check (/) in the table below whether you think the numbers of each species have increased, decreased or remained the same in your area over the past 10 years and give any reason you may know for a change in numbers (if any).

Species	Remained the same	Increased	Decreased	Reason for a Change (if any)
Pheasants				
Hungarian Partridge				
Ruffed Grouse				
Ducks				
Sharptail Grouse				
Geese				
Rabbits				
Whitetail Deer				
Mule Deer				

5. Do you like to see wildlife on your land? Check (/)

Like to very much	_____
Don't really care	_____
Would rather not have them on your land	_____

6. Do you approve of sport hunting of wildlife? Check (/)

Approve of it	_____
Don't really care	_____
Are against it	_____

7. About how many hunters would you estimate hunted on your land this fall? _____

8. What is the greatest number of hunters you actually saw on your land at any one time this fall? _____

9. How many hunters asked permission to hunt on your land this fall?

To hunt deer _____ To hunt upland birds _____ To hunt waterfowl _____

marks on original

10. Please check (/) in the table below whether you think the amount of hunting activity in your area has increased, decreased or remained the same over the last 10 years, or during the time you have lived in the area.

Type of Hunter	Increased	Decreased	Remained the Same
Deer Hunters			
Upland Bird Hunters			
Waterfowl Hunters			

11. Do you farm your land yourself or rent it out? Check (/)
Farm it yourself _____ Rent it out _____ Neither _____

12. How many acres do you own or operate (include land you rent, if any, as well as land you own)? _____

13. How many acres of your total property (owned and rented) are improved (have been cultivated)? _____

14. How many acres of your total property (owned and rented) are unimproved (have never been cultivated)? _____

Of this unimproved land, about how many acres are:
sloughs, marshes, streams? _____
native grass? _____
trees, willows, shrubs? _____

15. During this past season, how many acres did you use for:

grain or oilseed crops _____ summerfallow _____
tame hay or tame pasture _____ native hay _____
native pasture (including bush) _____

16. How many miles or what part of a mile of shelterbelt (planted trees, bush along fences, etc.) are there on your property? _____ miles.

17. Do you have NO HUNTING or NO TRESPASSING signs posted on your land? Yes____ No ____
If yes, in what year did you first post your land? _____

18. Do you plan to post your land next year? Check (/) Yes _____ No _____

19. If hunters ask permission, do you allow them to hunt on your land? Check (/)
Deer hunters Yes _____ No _____
Upland bird hunters Yes _____ No _____
Waterfowl hunters Yes _____ No _____

20. Even if you do allow hunting on your land, would you rather that no one hunted there?
Yes _____ No _____

21. If you either do not allow hunting on your land or would rather it didn't take place, what is your main reason? _____

_____

_____

marks on original

22. Please indicate (in the table below) the number of times, if any, you had trouble from hunters this fall and where possible, estimate the dollar value of loss that occurred?

Type of trouble	No. of times it occured this fall	Approximate dollar value of loss incurred (if possible to estimate)
Gates left open		
Fences cut or damaged		
Garbage left around		
Open pits left		
Crop trampled		
Building or Machinery damaged		
Livestock injured or killed		
Other (Specify) _____ _____		

23. What general kinds of trouble (if any) have you had from hunters other years?

_____

_____

24. Did you buy any of the following hunting licenses this year? Check (✓)

Deer (whitetail or mule) _____
Bird _____
Canada migratory game bird permit _____

25. As you know, farmers cannot make any money directly from the wildlife living on their property. Do you have any suggestions for ways in which farmers could be provided with income for having wildlife on their land? _____

_____

_____

_____

_____

_____

26. Do you have any suggestions on how game laws and hunting regulations for your area could be improved? _____

_____

_____

_____

_____

_____

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CONFIDENTIAL

1974

WILDLIFE QUESTIONNAIRE

(1) Location of Farmstead or Acreage

1/4 _____ Sec. _____ T. _____ Rge. _____

(2) Please check (✓) which of the following birds and animals you have seen on your property during the past year.

Pheasants	_____	Whitetail Deer	_____
Hungarian Partridge	_____	Mule Deer	_____
Ruffed Grouse (Bush Partridge)	_____	Ducks	_____
Sharptail Grouse (Prairie Chicken)	_____	Geese	_____
		Rabbits	_____

(3) Please check (✓) which of the following birds and animals you have seen on your property during the past Winter Months.

Pheasants	_____	Sharptail Grouse (Prairie Chicken)	_____
Hungarian Partridge	_____	Whitetail Deer	_____
Ruffed Grouse (Bush Partridge)	_____	Mule Deer	_____

(4) Do you like to see wildlife on your land?
Check (✓).

like to very much	_____
like to	_____
indifferent	_____
dislike	_____
dislike strongly	_____

(5) If hunters ask permission, do you allow them to hunt on your land?
Check (✓).

Deer hunters	Yes	_____	No	_____
Upland bird hunters	Yes	_____	No	_____
Waterfowl hunters	Yes	_____	No	_____

Comments if any?

_____

_____

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(6) If you allow hunting with permission, would you be willing to post signs on your land that lists your name, phone and location where hunters may obtain permission. Check (✓).

Agree strongly _____
Agree _____
Undecided _____
Disagree _____
Disagree strongly _____

(7) If you permit hunting, would those hunters who have taken the Provincial Hunter Training Program be treated differently from those who have not. Check (✓).

Permit only hunters with Hunter Training Certificate _____
Prefer hunters with Hunter Training Certificate _____
Indifferent to hunters with Hunter Training Certificate _____

(8) If all hunters were forced to complete an extensive hunter program to obtain a hunting certificate, would this increase your willingness to allow hunters on your property?
Check (✓).

Increase strongly _____
Increase _____
No change _____
Decrease _____
Decrease strongly _____

(9) If you do allow hunters approximately how many hours does the average hunter spend on your land?

_____ hours

(10) On the basis of the time spent on your land, by an average hunter, how many hunters per week do you think your land can support?

_____ Hunters per week.

(11) If hunting on private land was restricted to hunters on foot by law, would this increase your willingness to allow hunters on your property?
Check (✓).

Increase strongly _____
Increase _____
No change _____
Decrease _____
Decrease strongly _____

... 3

(12) Do you think that farmers should be paid in some form if they allow hunting on their property? Check (✓).

Agree strongly	_____
Agree	_____
No opinion	_____
Disagree	_____
Disagree strongly	_____

(13) Do you feel that hunters should pay a farmer directly for the privilege of hunting on that farmer's property? (i.e. user charge). Check (✓).

Deer hunters	Yes	_____	No	_____
Upland bird hunters	Yes	_____	No	_____
Waterfowl hunters	Yes	_____	No	_____

(14) If your answer is Yes for any of the above, in question (13), what fee would you expect from the hunter?

	Dollar fee per hunter per day
Deer hunter	_____
Upland bird hunter	_____
Waterfowl hunter	_____

(15) If you were permitted by law to collect a user charge from hunters, would this increase your willingness to develop suitable wildlife habitat on your property? Check (✓).

Increase strongly	_____
Increase	_____
No change	_____
Decrease	_____
Decrease strongly	_____

(16) Would you be in favor of leasing the hunting rights of your property to individual hunters or groups of hunters? Check (✓).

Deer hunters	Yes	_____	No	_____
Upland bird hunters	Yes	_____	No	_____
Waterfowl hunters	Yes	_____	No	_____

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(17) Would you be in favor of leasing the hunting rights of your property to hunting clubs?
Check (✓).

Deer hunters	Yes _____	No _____
Upland bird hunters	Yes _____	No _____
Waterfowl hunters	Yes _____	No _____

(18) If you are willing to lease your property, what amount per season would you expect?

	Leasing fee per season
Deer hunters	_____
Upland bird hunters	_____
Waterfowl hunters	_____

(19) If you are willing to lease the hunting rights of your property, approximately what percentage of your total farm property would you consider leasing?

_____% of land for leasing.

(20) If you are willing to lease the hunting rights of your property, which month(s) of the year would you prefer to lease.

_____ preferred leasing months.

Comments if any? _____

_____

(21) Would you be in favor of a government subsidy (such as a permanent easement or a tax rebate) for farmers who keep unimproved land used by wildlife? Check (✓).

Agree strongly	_____
Agree	_____
Undecided	_____
Disagree	_____
Disagree strongly	_____

(22) If a government subsidy was paid to you, what amount per acre for unimproved land would you expect?

_____ dollars per unimproved acre.

(23) Would this government subsidy increase your willingness to permit hunters on your property? Check (✓).

Increase strongly _____
Increase _____
No change _____
Decrease _____
Decrease strongly _____

(24) Would a government subsidy encourage you to allow portions of your land to return to its natural state? Check (✓).

Increase strongly _____
Increase _____
No change _____
Decrease _____
Decrease strongly _____

(25) Would you be willing to work with the Alberta Fish and Wildlife Division to develop your unimproved land to make it more suitable for wildlife? Check (✓).

Agree strongly _____
Agree _____
Undecided _____
Disagree _____
Disagree strongly _____

Comments if any? _____

_____

(26) Which of the following forms of compensation are unacceptable to you? Check (✓).

User charge _____
Lease hunting rights _____
Government subsidy _____
Pay farmer for damage caused by wildlife _____
Pay farmer for damage caused by hunters _____

(27) Number in order to preference (1st, 2nd, and 3rd choice) the following forms of compensation that are acceptable to you?

User charge _____
Lease hunting rights _____
Government subsidy _____
Pay farmer for damages caused by wildlife _____
Pay farmer for damages caused by hunters _____

(27) Cont.

Please indicate any specific reasons you may have for your choice?

_____

_____

_____

APPENDIX C

SURVEY DATA

TABLE C-1

CHI-SQUARED VALUES OBTAINED FOR THE VARIABLES USED TO TEST FOR NON-RESPONSE BIAS*

Variable Tested	Chi-squared Value**
Number of Landowners Allowing Deer Hunting	0.49192
Number of Landowners Allowing Upland Bird Hunting	0.66692
Number of Landowners Allowing Waterfowl Hunting	0.00015
Response to a Compulsory Hunter Training Program	1.57738
Response to a Law Forcing Hunters to Hunt on Foot	3.03910
Response to a Government Subsidy Program	0.06978
Response to a Habitat Improvement Program	0.11581

* The number of landowners in the first and second mailings was 205 and 168, respectively.

** At the 95 percent level of confidence, all the chi-squared values were insignificant.

TABLE C-2

RESPONSE OF GROUPS A AND B TO THE PROPOSED PROGRAMS

	Program												
	Compulsory Training	Hunt on Foot	User Fee System				Leasing Program			Government Subsidy			Habitat Improvement Program
			Deer	Upland	Waterfowl	Effect Habitat	Deer	Upland	Waterfowl	Subsidy	Effect Access	Effect Habitat	
Group A													
Favor	47.8	62.7	37.2	34.4	25.1	23.1	7.8	6.1	17.3	69.4	32.8	34.7	49.8
Neutral	48.6	33.3				68.1				17.3	62.4	55.3	28.9
Do Not Favor	3.6	4.0	62.8	65.6	74.9	8.8	92.2	93.9	82.7	13.3	4.8	10.0	21.3
Group B													
Favor	35.6	25.5	54.3	55.6	48.9	18.4	5.2	5.2	6.7	60.0	14.9	20.0	38.7
Neutral	59.3	69.1				75.5				26.7	74.5	75.6	29.5
Do Not Favor	5.1	5.4	45.7	44.4	51.1	6.1	94.8	94.8	93.3	13.3	10.6	4.4	31.8
Chi-squared Values	2.97	28.4 *	4.63 *	7.11 *	9.69 *	1.04	.462	.062	4.29 *	2.25	7.48 *	6.47 *	2.78

* Indicates that the response of Group A and Group B differ significantly at the 95 percent level of confidence.

TABLE C-3

THE ATTITUDES OF LANDOWNERS TOWARD HAVING WILDLIFE ON THEIR LAND

Category	Number	Percent of Sample (373)*	Percent of Respondents (361)**
Liked to very much	258	69.2	71.5
Like to	74	19.9	20.5
Indifferent	21	5.6	5.8
Dislike	6	1.6	1.7
Dislike Strongly	2	0.5	0.5
No Answer	12	3.2	
TOTAL	373	100	100

* The total number of landowners in the questionnaire sample was 373.

** Of the total number of landowners, 361 responded to the question.

TABLE C-4

ATTITUDES OF THE LANDOWNERS IN GROUP A TOWARD THE POSTING OF "NO TRESPASSING WITHOUT PERMISSION" SIGNS

Category	Number	Percent of Total (287)*	Percent of Respondents (278)**
Agree Strongly	34	11.8	12.2
Agree	80	27.9	28.8
Undecided	66	23.0	23.7
Disagree	66	23.0	23.7
Disagree	32	11.1	11.6
No Answer	9	3.2	
TOTAL	287	100	100

* Group A consisted of 287 landowners.

** Of the landowners in Group A, 278 responded to the question.

TABLE C-5

ATTITUDES OF THE LANDOWNERS IN GROUP A TOWARD HUNTERS WHO HAD COMPLETED THE VOLUNTARY HUNTER TRAINING PROGRAM

Category	Number	Percent of Total (287)*	Percent of Respondents (249)**
Permit Only Hunters With Hunter Training Certificate	27	9.4	10.9
Perfer Hunters With Hunter Training Certificate	134	46.7	53.8
Indifferent to Hunters With Hunter Training Certificate	88	30.7	35.3
No Answer	38	13.2	
TOTAL	287	100	100

* Group A consisted of 287 landowners.

** Of the landowners in Group A, 249 responded to the question.

TABLE C-6

EFFECT OF A COMPULSORY HUNTER TRAINING PROGRAM ON ACCESS TO PRIVATE LANDS

Category	Number	Percent of Sample (373)*	Percent of Respondents (353)**
Increase Strongly	51	13.7	14.4
Increase	113	30.3	32.0
No Change	175	46.9	49.6
Decrease	2	0.5	0.6
Decrease Strongly	12	3.2	3.4
No Answer	20	5.4	
TOTAL	373	100	100

* The total number of landowners in the questionnaire sample was 373.

** Of the total number of landowners, 353 responded to the question.

TABLE C-7

EFFECT OF A LAW FORCING HUNTERS TO HUNT ON FOOT ON ACCESS TO PRIVATE LANDS

Category	Number	Percent of Sample (373)*	Percent of Respondents (349)**
Increase Strongly	82	22.0	23.5
Increase	115	30.8	33.0
No Change	137	36.7	39.2
Decrease	5	1.3	1.4
Decrease Strongly	10	2.7	2.9
No Answer	24	6.5	
TOTAL	373	100	100

* The total number of landowners in the questionnaire sample was 373.

** Of the total number of landowners, 349 responded to the question.

TABLE C-8

LANDOWNERS' ATTITUDE TOWARDS BEING COMPENSATED IF THEY ALLOW PUBLIC HUNTING ON THEIR LAND

Category	Number	Percent of Sample (373)*	Percent of Respondents (348)**
Agree Strongly	66	17.7	19.0
Agree	91	24.4	26.1
No Opinion	111	29.8	31.9
Disagree	65	17.4	18.7
Disagree Strongly	15	4.0	4.3
No Answer	25	6.7	
TOTAL	373	100	100

* The total number of landowners in the questionnaire sample was 373.

** Of the total number of landowners, 348 responded to the question.

TABLE C-9

EFFECT OF A USER FEE SYSTEM ON THE DEVELOPMENT OF HABITAT AREAS ON PRIVATE LANDS

Category	Number	Percent of Total (132)*	Percent of Respondents (124)**
Increase Strongly	19	14.4	15.3
Increase	27	20.5	21.8
No Change	72	54.5	58.1
Decrease	3	2.3	2.4
Decrease Strongly	3	2.3	2.4
No Answer	8	6.0	
TOTAL	132	100	100

* A user fee system for at least one type of hunting activity was favored by 132 of the total landowners in the sample.

** Of those landowners favoring a user fee system, 124 responded to the question.

TABLE C-10

ATTITUDES OF LANDOWNERS TOWARD LEASING OF HUNTING RIGHTS TO INDIVIDUALS OR GROUPS OF HUNTERS

Category	Number	Percent of Sample (373)*	Percent of Respondents
For Deer Hunting			
Agree	25	6.7	8.2
Disagree	281	75.3	91.8
No Answer	67	18.0	
For Upland Bird Hunting			
Agree	19	5.1	6.3
Disagree	282	75.6	93.7
No Answer	72	19.3	
For Waterfowl Hunting			
Agree	49	13.1	14.8
Disagree	281	75.3	85.2
No Answer	43	11.6	

* The total number of landowners in the questionnaire sample was 373.

TABLE C-11

ATTITUDES OF LANDOWNERS TOWARD LEASING HUNTING RIGHTS TO HUNTING CLUBS

Category	Number	Percent of Sample (373)*	Percent of Respondents
For Deer Hunting			
Agree	14	3.8	4.4
Disagree	303	81.2	95.6
No Answer	56	15.0	
For Upland Bird Hunting			
Agree	13	3.5	4.1
Disagree	305	81.8	95.9
No Answer	55	14.7	
For Waterfowl Hunting			
Agree	30	8.0	8.8
Disagree	311	83.4	91.2
No Answer	32	8.6	

* The total number of landowners in the questionnaire sample was 373.

TABLE C-12

ATTITUDES OF LANDOWNERS TOWARD A GOVERNMENT SUBSIDY FOR UNIMPROVED LAND USED BY WILDLIFE

Category	Number	Percent of Total (373)*	Percent of Respondents (309)**
Agree Strongly	114	30.6	36.9
Agree	96	25.7	31.1
Undecided	58	15.5	18.8
Disagree	23	6.2	7.4
Disagree Strongly	18	4.8	5.8
No Answer	64	17.2	
TOTAL	373	100	100

* The total number of landowners in the questionnaire sample was 373.

** Of the total number of landowners, 309 responded to the question.

TABLE C-13

EFFECT OF A GOVERNMENT SUBSIDY ON INCREASING HUNTER ACCESS TO PRIVATE LANDS

Category	Number	Percent of Total (210)*	Percent of Respondents (203)**
Increase Strongly	25	11.9	12.3
Increase	58	27.6	28.6
No Change	116	55.2	57.1
Decrease	0	0	0
Decrease Strongly	4	1.9	2.0
No Answer	7	3.4	
TOTAL	210	100	100

* A government subsidy program was favored by 210 of the total number of landowners sampled.

** Of the landowners favoring a government subsidy program, 203 responded to the question.

TABLE C-14

EFFECT OF A GOVERNMENT SUBSIDY ON ENCOURAGING LANDOWNERS TO CREATE NEW HABITAT AREAS

Category	Number	Percent of Total (210)*	Percent of Respondents (203)**
Increase Strongly	33	15.7	16.3
Increase	56	26.7	27.6
No Change	107	50.9	52.7
Decrease	1	0.5	0.5
Decrease Strongly	6	2.9	2.9
No Answer	7	3.3	
TOTAL	210	100	100

* A government subsidy program was favored by 210 of the total number of landowners in the sample.

** Of the landowners favoring a government subsidy program, 203 responded to the question.

TABLE C-15

LANDOWNERS WHO ALLOW HUNTING WITH PERMISSION, 1971*

Category	Number	Percent of Sample (732)**	Percent of Respondents
Deer Hunting			
Allow	321	43.9	58.6
Do Not Allow	227	31.0	41.4
No Answer	184	25.1	
Upland Bird Hunting			
Allow	375	51.2	65.1
Do Not Allow	201	27.5	34.9
No Answer	156	21.3	
Waterfowl Hunting			
Allow	554	75.7	85.9
Do Not Allow	91	12.4	14.1
No Answer	87	11.9	

* The results reported were calculated from the data collected by W.S. Pattison, "We Raise 'Em - You Shoot 'Em: A Study of Public Hunting on Private Lands" (Edmonton: Alberta Department of Agriculture, Resource Economics Branch, 1973).

** The total number of landowners in this questionnaire sample was 732.

TABLE C-16

LANDOWNERS' PREFERENCE TOWARD ALTERNATIVE COMPENSATION PROGRAMS*

Program	Number of Times Chosen 1st.	2nd.	3rd.	Sum of Weighted Preference**
User Fee System	26	9	24	120
Leasing of Hunting Rights	2	12	13	43
Government Subsidy Program	65	34	86	349
Pay Farmer for Damages Caused by Wildlife	108	85	26	520
Pay Farmer for Damages Caused by Hunters	69	100	63	470

* Of the total number of landowners, 270 responded to the question.

** The weightings for 1st., 2nd., and 3rd. choice were, 3,2,and 1, respectively. This weighting system was chosen over other possible weighting schemes because of its simplicity.